Serfojee Rajah. 1827

AN

ESSAY

ON THE

BATH WATERS.

VOL. II

On their EXTERNAL USE.

In TWO PARTS.

I. On Warm Bathing in general.

II. On the External Use of the Bath Waters.

By WILLIAM FALCONER, M.D. F.R.S.

BATH: Printed by R. CRUTTWELL,

For T. LOWNDES, in Fleet-Street, London;

And sold by the Booksellers in Bath.

TO

JOHN FOTHERGILL,

AND

PHILIP DELACOUR,

DOCTORS OF PHYSIC,

THIS BOOK

IS INSCRIBED

BY

Their obliged

And faithful humble Servant,

The AUTHOR.

On the EXTERNAL USE of the BATH WATERS.

HAVING in the firſt volume treated of the internal uſe of the Bath Waters, I propoſe in the ſecond to give an account of their external uſe. But in order to make this ſubject more generally intelligible, I ſhall premiſe ſomething concerning Warm Bathing in general.

Warm Bathing may be defined, the application of a fluid, heated to ſuch a degree as to feel warm to the touch, to the whole or any part of the body. Definition of warm bathing.

It is evident that the above definition admits of great latitude as to the degree of heat extending from that, when the fluid begins to feel ſenſibly warm to the touch,

to the greatest degree that the human body is capable of sustaining.

Degrees of heat which constitute a warm bath.

In my opinion about 80 degrees* of Farenheit's thermometer is the lowest point at which we can fix a warm bath. I confess that one of several degrees below it, feels warm to the hand, but always excites a sensation of cold when applied to the body, and probably only feels warm to the hand from our habit of comparing it with other objects of touch which are in general below that degree of heat. Nay, even water of 80 degrees, and as far as 84 or 85, excites a degree of rigor on first entering, and only can exert the effect of a warm bath, if continued in some time. Eighty degrees then of Farenheit's thermometer may be considered as the lowest degree of a warm bath, as all below that are more properly temperately cold ones. This may be increased to about 120 degrees, though at this point it is scarcely tolerable to the human body.

---

* Some physicians place the limits of a warm bath between 62 and 90 degrees of heat.

We have, indeed, accounts of considerably greater degrees of heat being employed among the Russians* and some Indian savage nations; but these accounts are not very accurate, and moreover their manner of life and climate varies so much, that little analogy could be drawn from the practice applicable to the more moderate situations of Europe.

Add to this, that warm bathing is used among them as a customary entertainment as well as medicinally, and they are gradually habituated to sustain greater degrees of heat than we who use it so seldom can endure.

Action of the warm bath on the human body.

The action of the warm bath on the human body may be considered in two lights; first, as mechanical; and secondly, as acting on the nerves or solida viva; and perhaps to these might be added, a third, of its chemical effects when the fluid made use of is absorbed into the body, and thus acts upon the fluids contained in it, by altering their quality or consistence.

---

* The Russian baths, according to the Abbe Chappé, are heated to 144 deg. of Farenheit's thermometer.

Variation of the effects of warm bathing on the human body.

Warm bathing, according to the foregoing definition, is capable of admitting of ſeveral variations, which may alter its effects.

As to the quality of the fluid.

I. As to the quality of the fluid uſed.

In ſome old writers we meet with accounts of * baths of oil, wine, milk, and other fluids; but theſe are at preſent laid aſide, and water, either ſimple, or as impregnated with ſubſtances which impart their own proper qualities to it, is now univerſally the conſtituent part of all baths.

It appears then that under this head warm baths may be comprehended under the ſubdiviſion of

1. Thoſe of ſimple water; and,

2. Of water impregnated with ſubſtances which impart qualities to it which it did not poſſeſs as ſimple water, called Medicated Baths. Under this head many mineral waters are comprehended.

* Vide Etmuller, vol. II. p. 385.

II.

II. The effects of warm bathing alſo differ according to the degree of immerſion, or proportion of the ſurface of the body to which the fluid is applied.

According to the degree of immerſion

Under this head then warm baths may be conſidered as general, wherein the whole body is immerſed; or partial, wherein only a part of it is expoſed to the action of the water, called Topical Baths.

Of this latter kind, the moſt common are, a bath wherein the body is immerſed as high as the waiſt, called a Semicupium, and one wherein the feet and legs only are immerſed, called a Pediluvium.

III. Warm baths alſo have their effects varied according to the mode of application of the fluid, as whether it be applied in the way of quiet immerſion, or thrown upon the body, or any part of it, with a degree of force as in ſtillicidia, pumps, douches, &c. The latter of theſe belongs principally to topical baths.

According to the method of applying the bath.

IV. The form likewiſe in which the bath is applied, alters its effects in a conſiderable degree, as whether it be applied in

According to the form in which the bath is applied.

in its uſual form, or as converted into vapour, called a Vapour Bath.

Difference of ſpecific gravity of little conſequence.

The difference of ſpecific gravity in the fluid made uſe of, was formerly thought to vary the effects of bathing in general very conſiderably; but this has been of late years diſregarded in a great degree, both on account of the comparative difference of gravity of the fluids being very inconſiderable, and beſides, it is now juſtly queſtioned, if the preſſure on the body in bathing, on which ſo much ſtreſs was formerly laid, was not greatly overrated as to its effects,* ſince in cold bathing we ſee the ſame good conſequences enſue when the water is applied in a manner wherein the ſpecific gravity could not act in the above-mentioned manner, as when the water is let fall on the body from a dependent bath.

---

* A great preſumption, that the different ſpecific gravity of the fluid uſed as a bath is of little importance, is drawn from the obſervation that little change is perceived from the different preſſure of the atmoſphere, as when the barometer is as high as 30-4, or as low as 28, or on high hills at 20, or even 16, which are much greater proportional differences than could occur in a warm bath, and are likely to be longer continued.

I ſhall now proceed, in the order abovementioned, to treat of the effects of warm bathing in general on the human body. But as I mean this only as explanatory of, and introductory to my general ſubject, which is, to ſpeak of the external uſe of the Bath waters, it muſt be expected that I ſhould be as compendious as the ſubject will admit of.

Firſt, then, as to

The QUALITY *of the* FLUID.

Simple water is here placed firſt, as being moſt commonly uſed, and as being the foundation of baths in general. Quality of the fluid.

Under this head I ſhall conſider the effects of the application of warm water to the body, through its ſeveral modes of action. Effects of the application of warm water to the human body.

Water then applied to the ſurface of the human body, diſſolves the mucus naturally adhering to the outer ſkin, or cuticle, and at the ſame time waſhes off all adhering foulneſs. Its effects on the ſurface.

By

By theſe means it renders the openings of the excretory veſſels more free, and procures a more eaſy and ſpeedy paſſage for the perſpirable matter, or cuticular diſcharges.

By the ſame means it clears the ſkin of other acrid ſubſtances, caſually adhering to it, which, if ſuffered to remain, might be productive of much miſchief by their ſtimulating quality. One of the principal of theſe is the relicks of perſpiration which is not exhaled from the ſurface, and from the heat of the body, and its animal nature, is apt to contract a putrid acrimony.

Hence in hot countries, where this evacuation is very copious, and the heat of the body and ſurrounding atmoſphere are very conſiderable, frequent ablutions are neceſſary to prevent the collection of the perſpirable matter on the ſurface of the body, which would be eſpecially dangerous in circumſtances which increaſed its quantity and diſpoſition to a putrid acrimony.

Beſides the acrid matter thrown out in form of perſpiration, in ſeveral diſorders

various substances collect under the cuticle, and either transuding through it, or passing through the excretory ducts, form a kind of crust * on its surface, highly prejudicial, and tending to increase the disorder. These water dissolves, or washes off, and thus procures a free exit for all the cutaneous discharges which had been obstructed by it.

Water likewise, by softening and relaxing the cuticle itself, must procure a more free exit for all substances collected beneath its surface, by diminishing the rigidity of the sides of the excretory ducts, and thus rendering them more † extensible in diameter as well as length.

---

* This frequently occurs in the gout.

† I examined the back of my hand with a microscope. The cuticular pores were scarce discoverable, and the prominences between the rugæ appeared shining and rather corrugated. After immersing it 15 minutes in water, about 104 degrees of heat at a medium, I again examined it. The prominences now appeared much more relaxed and soft, the cutaneous pores were easily discoverable, and small drops of perspiration appeared at each of their orifices. The weather was at this time very cold and frosty. The temperature of the room wherein I had sat some time, was about 55 deg. The heat of my hand was about 91½, and I did not feel the sensation of cold in it when I first examined it. I have [illegible] quently observed the pores of the epidermis greatly enl[illegible]

By the ſame power it muſt increaſe our ſenſe of feeling, which is always more acute or obtuſe as the cuticle which covers the part is thicker or thinner, harder or ſofter. So far as to its effects by its mechanical action on the ſurface of the body; but in another way they are ſtill more extenſive.

As abſorbed into the ſyſtem.

The water is taken up in conſiderable quantity by the abſorbent veſſels, plentifully diſperſed over the ſurface of the body. By theſe it is carried through the lymphatic ſyſtem*, the humours of which it di-

---

in the portion of the cuticle ſeparated in a bliſter, ſo much as to admit a moderately ſized hair. This ſeems owing to its having been macerated a long time in the ſerum, and perhaps to its being diſtended by the fluid collected between the true ſkin and the cuticle.

* In order to gain ſome information relative to the quantity of fluid abſorbed, I made the following experiment: Into a china bowl about ten inches diameter, I poured about four pounds and a half of water heated to 112 degrees of Farenheit's Thermometer; I then weighed the bowl with the water as nearly as poſſible, which was no eaſy matter, on account of the conſtant evaporation; I then plunged my hand into it as high as the wriſt, having firſt chafed it with a cloth, and let it remain there exactly 15 minutes; I then took it out, and carefully wiped it dry with a piece of fine rag, which I had accurately weighed before; I then again weighed [illegible]g, and found it had gained 15 grains; I then weighed [illegible]owl with the water, which had loſt in weight ℥ ſs. ʒ ſs. [illegible] from which, if the 15 grains abſorbed by the rag be deducted,

lutes, and waſhes out the glandular cavities, diſſolves the acrimonious parts, and,

---

deducted, the loſs will be ℥ ſs. gr. 18. I next filled the bowl with water of the ſame temperature to the ſame height as before, and ſuffered it to ſtand (being firſt weighed) the ſame time which my hand had been immerſed in it, and in the ſame place as before; on weighing it a ſecond time, I found it had loſt of its weight ʒ ii. ℈ ii. or 160 gr. If this be deducted from the quantity loſt before, it will appear as follows:

	℥ ſs gr. xviii	or	258 grains
Deduct	ʒ ii ℈ ii	or	160
Remains	ʒ i ℈ i gr. xviii.	or	98 grains.

for the quantity abſorbed.

The heat of the water in both caſes was diminiſhed nearly alike, viz. to about 91 degrees and a half.

The above experiment was tried two hours before dinner; but in order to ſee the effects of taking in food, I repeated it the next day two hours after dinner, when the quantity abſorbed, after making the above deductions, amounted only to 43 grains. I then tried the ſame experiment on a perſon of a more tender frame and habit of body, wherein the quantity computed to be abſorbed was, two hours before dinner, 64 grains, and two hours after dinner 38 grains.

I tried the above experiment in warm weather, when the thermometer ſtood between 76 and 80 degrees; but at that time the perſpiration was ſo great as to render the weight of the whole ſeveral grains greater, notwithſtanding the large evaporation. The hand, in the above experiments, felt as if it was ſwelled, and appeared to the ſight obviouſly enlarged. The heat of it was a little increaſed, and the pulſe in that arm more full, but not quicker, than in the other.

Dr. Alexander found, according to his experiments, a much larger quantity of fluid to be abſorbed than is here mentioned; but he did not, as appears by his experiments, account for the quantity loſt by evaporation, which would probably be more in weight in his experiments than in thoſe now recited,

by its dilution, renders them less stimulating, and fits them to be carried off by the proper excretions.

---

cited, as the specific gravity of the water was increased by addition of nitre, which he proved to have evaporated with the water in a large proportion. In the first of the experiments here recited, the quantity absorbed by the whole body, supposing every part of it to absorb equally with the hand, and that the surface of the latter to the whole body, is as 1 to 60, will be 12 oz. ʒii. in the second ℥v. ʒiii. in the third nearly ℥viii. and in the fourth ℥iv. ʒvi.——These quantities, though greatly inferior to what Mr. Alexander had calculated, are yet considerable enough to be taken into consideration, especially when the particular qualities of the fluid employed are depended on. I am much inclined to suspect this absorption would be greater in many cases wherein we would wish to employ it, as in feverish disorders, attended with a dry skin, since I have found the absorption much the greatest when the perspiration was least.

This conjecture seems probable from an experiment by Dr. Thomas Simpson, wherein the absorption must have been much greater than what occurs commonly in our trials.

Cum homo adolescens, febre correptus, cui accesserat diarrhœa, cum extremo stupore sensuum nihil plane ore haurire vellet; quanquam immoderato æstu totus torresceret, quo humectaretur, jubeo in aquam egelidam immergi pedes: quo facto, protinus aquæ mirum cerno in vase decrementum, deinde ejusdem vix coloratæ, more cataractæ per anum effusionem.

Abbe Chappé mentions, that he found the cloaths he wore before he went into the bath too little when he came out of it.

Dr. Parr's experiments mention the face being red and tumid during the stay in the bath, and that this increased greatly as the heat of the water was augmented above 96 degrees; but the increase of the vessels on the surface of the body was not perceived 'till the heat was raised to 102 degrees.

I have frequently heard a sensation of fullness and distention of the vessels of the head complained of by those who use the warm bath, during their stay in it; and have observed the

The foregoing effects are in part applicable to water of any temperature, but are considerably greater as the heat is increased to the degrees mentioned as the utmost standard of a warm bath.

As rarefying the animal fluids by its heat.

The warm bath likewise acts very powerfully in rarefying the animal fluids; and it may have this effect in some measure, even though not above the degree which is commonly esteemed the general heat of the human body, viz. 96 degrees of Farenheit's thermometer.

It may at first sight seem extraordinary, that a fluid of 96 degrees of heat should, without any chemical operation, but merely by being brought into contact, increase the heat of one which is almost constantly of a greater degree; yet this seeming paradox may be easily reconciled, if we consider that the body is, in the general state of the atmosphere, exposed to a degree of heat greatly below animal heat. The body

the vessels of the head and face greatly enlarged, altho' the water never rose so high, which proves it was not owing to any relaxation of the cuticle, or of the absorbent or exhalant vessels by the contact of the water, as some have supposed.

then

then goes on losing, and the circumambient air gaining heat continually, and would in time be brought to one temperature, were it not for the vital principle which seems continually by means hitherto very imperfectly explained, but which seems most probably owing to the nervous power generating a fresh degree of heat.

Now this loss of heat from the body will be more or less in proportion to the temperature of the surrounding medium: therefore, if water, hotter than the usual temperature of the air, be closely applied to the surface of the body, it is obvious that the loss of heat must be less, and consequently the heat itself of the body increased above the usual degree; and this heat, and consequent expansion of the contained fluids, will be greater as the heat of the surrounding fluid is increased.

The more immediate effect of heat externally applied in this way, is upon the fluids contained in the vessels that lie nearest the surface of the body; but if this heat be continued some time, the fluids of the whole body become rarefied in their turn in the course of circulation. To this

it

it is afcribed, that the veins in fome degree appear turgid during warm bathing, or in a warm air, and appear diminifhed in the cold*.

---

* In order to throw fome light on the important queftion of the expanfility of the blood by heat, the following experiment was made:

I procured a glafs veffel to be made in form of a thermometer, with a bulb which held between 8 and 9 ounces, and a neck about 12 inches long, and about $\frac{1}{8}$ of an inch diameter. I filled this about $\frac{3}{4}$ into the neck with blood, which was taken from a perfon in health, and conveyed immediately into the veffel from the arm by means of a fmall funnel fixed into its neck. During the time of its filling the glafs veffel was fet in water, from 98 to 100 degrees of heat, which reached above 4 inches above the bulb of the glafs; I then corked up the end of the tube, and added as much more hot water to that in which it ftood, as raifed the thermometer to 120 degrees. I fuffered this to cool 'till it fell to 96 deg. and meafured the different heights to which it had rifen, I found it had rifen at 120 degrees about $\frac{4}{5}$ of an inch higher than at 96 degrees, which I found, by accurately meafuring the quantity, to be $\frac{1}{307}$ part of the whole bulk.

I tried the fame experiment with water, and found it more expanfible than blood in the fame degree of heat nearly as 3 to 2. I repeated the former of thefe experiments feveral times, and found very little alteration.

Thefe experiments feem to correfpond in a great meafure with thofe made by other authors. Sauvage found blood only increafed in bulk $\frac{1}{100}$ part even by a boiling heat, and both he and the Profeffor at Upfal deny that it is reduced into lefs compafs than it ufually takes up in the body, even by the greateft degree of cold.[a] And Haller afferts, from his own

---

[a] Frigus glaciale fanguinem in minus fpatium non comprimit.

Sauvage Element. Phyfiol. p. 138.

Such are the effects of the application of warm water to the human body, con-

---

own experience, that no perceptible augmentation of the bulk of the blood was discernible, even when the heat was raised to the boiling point.

Were we to trust to what might at first view be concluded from these experiments, all our theory concerning the expansion of the blood by heat is at once destroyed; yet the apparent increase of the bulk of the vessels, and of the whole body, the sensation of fullness and distention, and the proneness to hæmorrhage, which attend the use of the warm bath, seem difficult to be accounted for on any other principles.

An ingenious writer, whose name has been before mentioned in this work, and who will, I doubt not, do honour to the profession, has endeavoured to reconcile this difficulty, by ascribing an elastic quality to the blood, supposing it to be in a compressed state in the vessels[b]; and that when this pressure is removed by the relaxation of the sides of the vessels, the blood expands by its elastic property, and in this way seems to enlarge its bulk. But this theory is, in my opinion, as difficult to be maintained as the former. Haller relates, that it is found by experiment, that the blood could not be compressed into a smaller volume by a column of mercury of 36 inches, which is a much greater pressure than it could be supposed liable to undergo from the vessels of the body. Besides, other elastic fluids have this quality much increased by heat, which does not, by the above-mentioned experiments, appear to be the case with blood, whose bulk is scarce increased by it, even when all pressure is removed. But I am much inclined to suspect that the above experiments, which seem to weigh so strongly against the expansility of the blood by heat, are more specious than satisfactory to prove the point in question. All experiments of this kind, except very frequently repeated, lead to hazardous conclusions;

---

[b] Dr. Parr's Thesis.

ſidered as an inanimate machine; but if we conſider it as poſſeſſed of a living ſen-

---

concluſions; and frequently, even when made in the beſt manner poſſible, it is difficult to draw any certain deductions from them. In the preſent caſe, I doubt if we can determine any thing with certainty concerning the nature of the blood from experiments made upon it when let out of the body. The blood undergoes a great change by coming into contact with the external air, and probably a degree of decompoſition, as appears from the ſeparation of its component parts. During the flow of the blood from the vein into the veſſel which receives it, ſeveral of its volatile parts eſcape, and among them a portion of elaſtic air, probably of the inflammable kind, as appears by ſome experiments, on which the expanſility of the blood by heat ſeems in a great meaſure to depend. Moreover, it is extremely difficult to convey the blood into a veſſel of ſuch a form as will meaſure it accurately without its coagulating. I repeatedly tried the experiment with all the precautions I could ſuggeſt, ſuch as receiving the blood immediately from the vein into the veſſel I had contrived to meaſure it, which laſt was at the ſame time immerſed in a veſſel of water as near as poſſible to the degree of animal heat. Yet I never could, even by many repeated trials, preſerve it uniformly fluid, but that ſome ſeparation had taken place, though very incomplete.

When I tried a large clear vial for that purpoſe, I found I could preſerve the fluidity pretty well, but that form did not admit any accurate admeaſurement of the increaſe or diminution of the blood's bulk. But it ſeems likely that air is not the only volatile elaſtic ſubſtance that is thus exhaled from the blood. The volatile alkali, or ſome volatile ſaline ſubſtance nearly reſembling it, ſeems to enter into the compoſition of the volatile part evaporated. Haller mentions the halitus of the blood, when carefully received into glaſs veſſels, as being of a ſaline taſte, and rather of a fœtid ſmell, reſembling urine, which was increaſed when the animal was diſordered, and more remarkable in carnivorous than herbivorous animals. All which are characteriſtic marks of the volatile alkali, which is itſelf a very elaſtic ſubſtance, and has this quality

tient principle, we ſhall find the effects of warm water upon it much more remarkable.

---

greatly augmented by heat. I think then on the whole that as many circumſtances concur to prove the expanſion of the blood by heat while in the human body; and as the arguments which are adduced to diſprove it were drawn from experiments made on the blood in a different ſtate and ſituation from what it is while circulating in the veſſels, that nothing can be concluded from them to prove the falſity of the former hypotheſis. But at the ſame time that I think the expanſion of the blood by heat the moſt rational and probable method of accounting for ſeveral of the effects of warm bathing, I would not be underſtood to aſſert that it is demonſtratively proved to be true, but only that it is, in my opinion, the moſt lik ly to be ſo of any that I have ſeen. Some light might perhaps be thrown on this important ſubject by experiments made on brute animals, by transfuſing their blood through a pipe into a veſſel with the air exhauſted from it, if poſſible, and cloſing it immediately, ſo as not to let it come into contact with the air, and then examining the effect of heat in expanding it. Yet I queſtion if this would be deciſive, as there is ſomething elſe neceſſary beſides the excluſion of the air, and a certain degree of heat to keep the parts of the blood in their natural ſtate, and preſerve its fluidity. This is proved by cupping, where the blood is generally found coagulated before it could have come into contact with the air, and, according to Haller, the blood has been found coagulated even in the veſſels of a living animal. This ſeems to be the caſe ſometimes with polypi, tho' the time at which theſe are formed is not very clear whether before or after, or perhaps in the agonies of death. Haller aſcribes the formation of polypi to the ceſſation of the blood's motion or circulation, which, if we judge from the appearance of the blood out of the body, ſeems very plauſible; but I am well aſſured that this alone is not always ſufficient to produce it, ſince I have ſeen the blood continue perfectly fluid for above twelve hours after death in a perſon who died apoplectic; and I have been well informed that this very commonly happens with thoſe that die ſuddenly. Beſides, many have continued in a ſyncope without any marks

ſtate,

The first effect of the warm bath seems to be that of a stimulant to the system in general.* As stimulant.

The heat of the body is increased†, the pulse accelerated and made stronger, the body

of the blood's circulation, and under water, or in a strangled state, a much longer time than the blood takes to coagulate when out of the body, and have recovered again without any suspicion or signs of the formation of polypi on the renewal of the blood's motion.

* Heat seems to be the most universal stimulus in nature to the nervous power, without a certain degree of which animal life cannot subsist. No animals, with which we are acquainted, are able to live when the temperature of their bodies is reduced to the degree at which water congeals, or 32 degrees of Farenheit's thermometer; and much the greatest number are destroyed, or at least rendered torpid, by a much less degree of cold; and several when the height of the thermometer is but a few degrees below the middle temperature of the air. Dr. Alexander found in his experiments, that no animalculæ could be produced in his putrefactive or fermenting mixtures, except in the summer months.

† The stimulant effects of the warm bath are scarce discernible until the heat is raised to 98 degrees, according to Dr. Parr's experiments.

98 gr. pulsus frequentia paulum aucta.

100 gr. pulsus frequentia paulatim aucta est ut post xxv minuta 72 micaret qui in statu naturali 60 in minûto micaret. Plenior idem cito evadebat.

102 gr. pulsus multo frequentior erat, post xxx minuta 100 vibrationes in minuto ostendebat cum aliter 68 ostendisset.

104 gr. post xx minuta pulsus & calor tantum mutabantur quam in experimento proximo post semihoram.

106 gr. pulsus & calor tantum augebantur post xv minuta quam in experimento proximo post xx minuta. Parr's Thesis.

body is ſwelled, and the blood veſſels on the ſurface appear diſtended.

Theſe effects are probably owing principally to the ſtimulus of the heat on the nervous ſyſtem, and in ſome meaſure to the rarefaction of the fluids, and conſequent diſtention of the veſſels, which, by ſtretching their fibres, muſt likewiſe act in ſome degree as a ſtimulus. This effect of the warm bath is greatly increaſed in proportion to the heat, eſpecially when this exceeds 96 degrees. Thus I have found the above effects very inconſiderable when the heat was not raiſed higher than 96 degrees, but very remarkable when increaſed to 100, or even 98.

As ſedative or antiſpaſmodic.

Another effect of the warm bath, not ſo immediate, but what generally ſucceeds to the foregoing, is that of ſedative or antiſpaſmodic. This may ſeem oppoſite to the foregoing, but not on that account incompatible with it. 'Tis obſerved of the warm bath, that when above the temperature to which the body is uſually expoſed, and at the ſame time not exceeding the natural heat of the human body, it al-

ways

ways excites a pleaſing ſenſation,* which, like all of that kind, excites a degree of relaxation (or at leaſt what ſeems to be ſo to our ſenſations) of the nervous ſyſtem. By expanding the circulating fluids, it overcomes the ſpaſmodic contraction of the containing veſſels, and thus renders the circulation more equable, and by the ſame means takes off ſpaſmodic diſorders that ariſe from inanition. By cauſing a greater flow of blood through the head,† and expanding the veſſels there, it diſpoſes to ſleep,‡ provided the ſtimulus be not ſo

---

* Such remedies as relax, and at the ſame time affect with an agreeable ſenſation, the muſcular fibres and nerves, rendering them thereby leſs likely to ſuffer from irritation, viz. the warm bath, ſemicupium, and pediluvium. Whytt's works, p. 681.

The warm bath affects the nerves with an agreeable ſenſation, removes ſpaſms in the ſmall veſſels, promotes an equable circulation, gently expands the fluids, and conſequently fills the whole veſſels of the body. Ibid.

Warm water, by its particular action on the nerves to which it is applied, renders the whole ſyſtem leſs ſenſible of any irritation. Whytt's works, p. 120.

† Balnea (calida ſcilicet) ad ſomnum blandum diſponere in foro medico eſt notiſſimum, quod tamen non alia ratione fit quam expanſionem ipſis humoribus inducant, unde etiam habitum corporis inflatum atque turgidulum reddunt. Hoffman, vol. vi. p. 84.

‡ Probably this is the foundation of the ſoporific effects of wine and ſpirituous liquors.

great as to produce any inflammatory irritation; and this effect of the warm bath is greatly assisted by the pleasing sensation it occasions.

As diaphoretic.

The warm bath likewise acts very powerfully on the secretions of the body, and particularly the perspiratory discharge.*

How it brings this about will be easily conceived, if we consider the account that has been before given of its effects in softening and relaxing the cuticle, and washing off all external foulness that might clog up or obstruct the mouths of the exhalant vessels; of its increasing the quantity of the fluids by absorption, and their bulk by rarefaction; and moreover of its stimulus, joined to a sedative quality, which is observed to promote this discharge very particularly. The care to keep the body

---

Warm baths procure a greater flow of warm rarefied blood through the head, and thereby dispose to sleep. Med. Essays, Edinb. vol. vi. Dr. Stevenson on the Pediluvium.

* By Dr. Parr's experiments, perspiration (insensible, I suppose,) was greatly increased by the warm bath, when at 96 and 98 deg. of heat. When raised to 100, 102, 104, or 106, the sweat became in the first perceivable, and grew in each degree gradually greater, 'till in the last it flowed in full streams from the face.

warm,

warm, after coming out of the bath, likewiſe contributes to promote this effect of it in a greater degree.

The warm bath ſometimes proves diuretic. If the body is in a bibulous ſtate, and no particular care taken to promote perſpiration by warmth of cloaths or warm liquors, more water may be abſorbed than paſſes off by perſpiration, which may then find its way by the urinary * ſecretions. In caſes likewiſe where the laſt-mentioned diſcharge is but ſmall from any conſtriction of the ſecreting organs, the warm bath generally increaſes the ſecretion, and thus acts as a diuretic by its antiſpaſmodic quality. As diuretic.

I have likewiſe often ſeen the warm bath greatly increaſe the diſcharge by expectoration. This may be eaſily conceived when we conſider how immediately the warm bath acts on the circulating fluids, and that the whole maſs of blood circulates through the lungs; ſo that its increaſed bulk, heat, and accelerated motion, As expectorant.

* Dr. Parr did not find any diuretic quality in the warm bath when raiſed above 96 degrees.

muſt

muſt be very ſenſibly felt there, and increaſe thoſe ſecretions.

As ſialagogue.

The ſalivary diſcharge likewiſe is much increaſed by warm bathing, as is evident from its effects in quenching thirſt, and the diſcharge from the noſe, augmented by the ſame means. This, I think, may be accounted for on general principles of the univerſal ſtimulus occaſioned by the warm bath, the abſorption of watery fluid, and the increaſed bulk and motion of the blood, which muſt undoubtedly increaſe the ſecretions in general.

As emmenagogue.

Warm bathing alſo has been found, by experience, to promote the menſtrual diſcharge very powerfully. Obſtructions of this kind are frequently owing to inertia of the uterine ſyſtem; and in theſe caſes, warm bathing, by its ſtimulus on the nerves, its accelerating the circulation, and increaſing the bulk and quantity of the fluids, is likely to prove emmenagogue. When the obſtruction is owing, as frequently happens, to ſpaſmodic conſtriction, warm bathing, by its ſedative or antiſpaſmodic quality, is found of the greateſt ſervice in relaxing the veſſels, and procuring a free paſſage for the accuſtomed evacuation.

INDICA-

INDICATIONS of the WARM BATH.

Such are the general effects of the warm bath on the human body. I ſhall now draw ſome inferences from them relative to the indications to which it is adapted. Warm bath when indicated.

From the detergent effects of the warm bath in cleanſing away foulneſs, and acrid irritating ſubſtances adhering to the ſkin, we may ſee the good effects likely to reſult from warm bathing in all cutaneous diſorders ariſing from that cauſe. By a like power, the warm bath procures an exit for any matters that may be accumulated between the true ſkin and the cuticle, or in the veſſels of the ſkin itſelf, whoſe paſſage outwards may have been obſtructed by foulneſs, blocking up the excretory ducts which paſs through the cuticle. When indicated as a detergent.

The warm bath alſo, by ſoftening and relaxing the cuticle itſelf, and the parts immediately connected with it, muſt render the cutaneous evaporations more free. On theſe accounts it has been found an efficacious remedy in cutaneous diſorders in general; ſince moſt of them ariſe from retention of that diſcharge, others cauſe it In cutaneous diſorders in general.

tic onſequentially, and all are aggravated by it.

In our climate, indeed, where perſpiration is moderate, we do not ſee many diſorders that can be attributed to this cauſe; as the relicks of this evacuation remaining on the ſurface of the body, or in the cutaneous veſſels, ſeldom continue long enough to contract any putrid acrimony. But in hot climates, where this diſcharge is very conſiderable, and the putrefactive diſpoſition much ſtronger than among us, it ſeems to be a principal ſource of theſe complaints, which are much more frequent there than in our climates. What ſtrengthens this opinion is the cuſtom of frequent ablutions, which is almoſt univerſal among the inhabitants of hot climates, owing, in all probability, to a natural inſtinct; and likewiſe the obſervation that, ſince cleanlineſs has been more attended to, cutaneous diſorders have been obſerved even among us to be leſs frequent and contagious, and to admit of eaſier cure.

In all probability, ſeveral Jewiſh religious ceremonies of this kind in the Jewiſh law,

law, and among the Mahomeddans and other Eaſtern nations, were political in their intention, in order to inforce, with more energy and efficacy, a cuſtom which appears ſo neceſſary to the health of the inhabitants.

It is not unlikely, that the efficacy of warm bathing in leprous diſorders is owing, in no inconſiderable degree, to its detergent quality, in cleanſing away the foulneſs which obſtructed the perſpiratory diſcharge, and by its relaxing and ſoftening the cutaneous pores, and thus rendering the paſſage through them more pervious. In the lepra.

I am likewiſe inclined to attribute the good effect of warm bathing in the decline of gouty complaints in ſome meaſure to the ſame cauſe. In the gout.

In this diſorder, towards the cloſe of the paroxyſms, there is frequently thrown out on the ſkin of the extremities an exſudation in form of a whitiſh powder or branny ſcurf, which ſeems to have tranſuded in a thicker form than that of perſpiration. As the cutaneous pores ſeem

to

to be the paſſage intended by nature for the evacuation of the gouty matter, it is evident that the keeping theſe in a pervious ſtate muſt be of the greateſt conſequence, and the uſe of the warm bath in this caſe will be evident from what has been before ſaid of its effects in this way.

Though the detergent effects of the warm bath are more immediately ſerviceable in thoſe diſorders which ſeem to owe their riſe to foulneſs adhering to the ſurface of the body, or lodged under the cuticle or in the perſpiratory ducts, it is obvious that they muſt be of great conſequence in all caſes where a free perſpiration is neceſſary, by cleaning the pores through which it is to paſs.

I ſhall ſpeak more of its effects in complaints of this kind when I come to treat of it as increaſing the ſecretion itſelf.

So far as to the indications of the warm bath as a detergent to the ſurface.

When indicated on account of the fluid abſorbed.

I ſhall next ſpeak of it as giving occaſion to an abſorption of watery fluid into the veſſels and habit of the body.

From

From the account before given of this effect of the warm bath, it is evident, it must be a remedy of great efficacy in many disorders whose cause lies in the animal fluids. Where the consistence of these in general is too thick, it dilutes them, and thus obviates complaints arising from lentor. Where acrimony prevails, it renders that less stimulant by its dilution; and, by its dissolving the acrimonious parts, fits them to be carried off by the proper excretions. On this account, probably, among others, warm bathing has been found of great service in the Lues Venerea, the contagion of which seems to reside particularly in the fluids; and it is not unlikely that the relief of the Scurvy by warm bathing may be in part owing to a like cause.

In the lues venerea.

In the scurvy.

By necessarily passing thro' the glands in the course of absorption, it washes out their cavities, and dissolves any acrimony lodged there; and thus, as well as by exciting their action in its passage through them, contributes greatly to remove obstructions of the glandular kind.

In glandular obstructions.

On

In the ſcrophula.

On this account the warm bath has been found ſingularly ſerviceable in the Scrophula, whoſe ſeat lies in the lymphatic glands, and ſeems to be in its nature a combination of acrimony with obſtruction.

In meſenteric obſtructions.

By the like powers, the warm bath has been found remarkably ſerviceable in obſtructions of the Meſenteric glands, and in liver complaints attended with an hardneſs and biliary obſtruction.

In glandular complaints in general.

In ſhort, as nearly all glandular complaints ſeem to be produced by, or attended with obſtruction, the warm bath may be ſaid to be generally ſerviceable in them, provided it can be uſed with ſafety in reſpect of its ſtimulus on the nerves and ſyſtem in general.

When indicated on account of its rarefying quality.

The warm bath ſeems in ſome caſes to be of ſervice by its rarefying effects on the fluids. In complaints ariſing from inanition, the warm bath often proves an effectual relief; the increaſe of the fluids' bulk occaſioned by its means ſupplying the deficiency in quantity.

By

By the ſame powers, in a great degree, it is of ſervice after large evacuations, when the body is debilitated, and the veſſels relaxed for want of their accuſtomed quantity of fluid. It proves, by the like quality, a very efficacious emmenagogue when that diſcharge, as frequently happens, has been ſuppreſſed by exceſſive evacuations. I am likewiſe inclined to attribute much of the antiſpaſmodic effects of warm bathing to its rarefying power*, owing to its diſtention overcoming the ſpaſmodic conſtriction, and thus reſtoring the equilibrium throughout the body. I imagine that this is in a great degree the cauſe of the efficacy of the pediluvium † in nervous head-achs, which often ſeem to ariſe from weakneſs and inanition.

In weakneſs from inanition.

In menſtrual ſuppreſſions.

So far as to caſes wherein the warm bath is indicated on account of its mechanical

* It is very probable that the deobſtruent qualities of the warm bath are owing in a great meaſure to this effect of it on the fluids, eſpecially, as Dr. Oliver obſerves, when we conſider that it is conjoined with a relaxation of the ſolids in general, and the ſides of the veſſels rendered ſoft, and yielding to the diſtending force of the rarefied humours.

Oliver on warm bathing in gouty caſes, p. 16.

† Vide Dr. Stevenſon's paper on the warm pediluvium, Edin. Med. Eſſays, vol. VI.

action

action on the human body: I ſhall next ſpeak of it as indicated from its effects on the vital and nervous ſyſtem.

When indicated as a ſtimulant.

I have before obſerved that the warm bath proves a powerful ſtimulus to the ſyſtem in general, accelerating and raiſing the pulſe, exciting the ſecretions, and quickening the ſenſations. On theſe accounts it is indicated (under certain limitations) where theſe effects are deſirable.

In palſy.

Among diſorders that require ſuch effects, paralytic * complaints are amoug the principal. The uſe of this remedy was generally acknowledged in this diſorder, until the late Dr. Mead (on what grounds I know not) declared it noxious univerſally in caſes of this kind. Later experience has, however, confirmed the teſtimony of former ages in its favour; and it is, I believe, now generally acknowledged, that Dr. Mead's† opinion was ill grounded.—From the ſenſible effects of the warm bath

* Balnea Vaporum, immerſiva, juvant. Boerhaave Aph. 1069.

† Calidæ Immerſiones paarlyticis omnibus nocent. Mead Monita & præcepta medica.

on

on the body, we have a great preſumptive evidence in its favour; as all the effects it produces are ſuch as our endeavours ſhould contribute to produce and promote, whatever means may be uſed for that purpoſe.

Another complaint, wherein the warm bath ſeems to be particularly ſerviceable on account of this quality, is the Chloroſis,* which is always attended with an inertia of the vaſcular ſyſtem, and frequently of the nervous one, both of which it contributes greatly to obviate. In the chloroſis.

Warm bathing likewiſe is of great ſervice on the ſame account in all menſtrual obſtructions, attended with languor and inertia of the ſyſtem, to which, in all probability, they are frequently owing; and more eſpecially where this diſcharge has ceaſed in conſequence of ſome extraordinary evacuation. In theſe caſes warm ba- In menſtrual obſtructions.

---

* Thermarum in noſtro morbo magnus eſt uſus. Preſervant enim non ſolum a chloroſi, ſed ipſam curant. Hoffman, vol. vi. p. 396.——Vide alſo Hoffman, vol. v. p. 321.

The ſemicupium is recommended by Sauvage in this complaint. Vide claſs 10. genus xxxiii.

Warm baths are adviſed by Boerhaave in this diſorder. Aphor. 75.

thing, by its ſtimulus on the nervous ſyſtem, and by its ſudden effect in increaſing both the bulk and impetus of the fluid, proves * a quick and efficacious remedy.

In cachectic caſes.

The warm bath is, by the ſame quality, an excellent remedy in many diſorders of the viſcera, ſuch as are commonly called cachectic, and which ſeem to owe their riſe to obſtructions of the meſenteric glands. Theſe, at their beginning, are generally accompanied with languor of the vital powers, and liſtleſſneſs to motion, together with a ſlow circulation, and diminution of the natural heat.†

In the firſt ſtage of this diſorder, when the obſtruction is recent, before any fixt pain, inflammation, or ſchirrhus, come on,‡ this remedy is extremely ſerviceable

* Optimum vero remedium ſunt thermæ. Hoffman, vol. v. p. 320. de fluxu menſium inhibito.

† Virium vitalium languor, lentior circulationis impetus, minor calor. Sauvage, deſcriptio cachexiæ, claſs x. ord. 2.

‡ Warm baths are recommended by Sauvage in this diſeaſe.

Utilius his frequens balneum eſt. Celſus, lib. 3. cap. xxii.

Warm baths are adviſed by Boerhaave in this diſorder, aph. 1178; and by Hoffman, de cachexia & chloroſi.

in

in quickening the circulation; thus increafing the impetus of the blood, (which contributes to remove the obftruction) and at the fame time exciting the action of the nerves, and reftoring the natural heat.

The ftimulant effects of the warm bath feem frequently to be of great fervice in icteric and other liver * complaints, which are generally, when recent, attended with fimilar fymptoms to thofe juft mentioned; both indeed probably arifing from the bile being regurgitated into the courfe of circulation, which generally happens in fome degree in cachectic diforders, and which feems to exert a narcotic influence on the nervous fyftem. In liver complaints.

It is not improbable that the coftivenefs, which fo frequently occurs in icterical cafes, may be owing to this effect of the

---

* Pigritia animi languor. Sauvage, defcriptio auriginis. Segnities, laffitudo. Sydenham.

Imbecilles funt, ignaviæ cedunt, animo demiffi. Aretæus.

Warm baths are advifed by Sauvage in aurigine frigida, clafs x. ord. 6. gen. xxx.

The warm bath is advifed by Celfus, de regio morbo.

Warm baths are advifed by Hippocrates, principally at the *beginning* of icterical complaints, and afterwards during the courfe of the diforder.—De locis in homine, cap. xl.

bile on the nerves, as well as to the want of its ſtimulus in the inteſtines.

In counteracting theſe effects the warm bath is likely to be of conſiderable ſervice, and may be uſed with ſafety, if tried before any great degree of pain or inflammation have been produced in conſequence of the obſtruction.

In hypochondrial diforders.

The ſtimulus of the warm bath ſeems to be, in ſome degree, the foundation of its uſe in hypochondriacal complaints. This diſorder, whatever its immediate cauſe may be, is always conjoined with a degree of torpor of the nervous ſyſtem, of the alimentary canal eſpecially; and on this the uſe of ſtimulant ſubſtances in this complaint is founded.

The warm bath here furniſhes an admirable general ſtimulus to the whole ſyſtem, which is more univerſal and full as efficacious as any internal medicine; and has this additional advantage, that it may be longer continued without loſing its effect.*

---

* The hot bath is adviſed by Boerhaave, vide aph. 1103. And vide Van Swieten's Commentary on the above. And by Alexander Trallianus, lib. 1. cap. xvi.

Nullus

By the ſame quality the warm bath proves often an effectual cure for ſterility in both ſexes, and is one of the ſafeſt as well as the moſt effectual of the remedies uſed for that purpoſe. In ſterility.

Such are the general caſes wherein the warm bath is indicated as a ſtimulant. I ſhall next ſpeak of it with regard to its ſedative or antiſpaſmodic qualities. One of the moſt ſimple complaints of this kind is the * locked jaw, in which the warm bath has been of eminent ſervice. When indicated as antiſpaſmodic.

Several kinds of ſpaſmodic colics, † the colica pictonum eſpecially, are alſo remarkable inſtances of its efficacy in this way, which it evidently relieves by taking off the ſpaſmodic ſtricture on the inteſtines accompanying theſe diſorders; and probably, by the like quality, it often proves In the colica pictonum, and flatulent cholic.

Nullus vero morbus eſt qui plus auxilii & levaminis a balneorum uſu percipiat quam affectio ſic dicta hypochondriaca. Hoffman, vol. iii. p. 212.

* Vide Medical obſervations, vol. ii. p. 148.

† Ex aqua tepida ſæpe reiterata ſemicupia proſunt. Tronchin, de colica pictonum. p. 147.

Balnea etiam proſunt ſi tepida. Tronchin, p. 153.

Huxham de colica damnoniorum, p. 29, 30, 31.

an effectual remedy for the flatulent colic, to which hypochondriacal constitutions are subject.

In the bilious colic.

The bilious * colic likewise has been eminently relieved by the same means in the most desperate circumstances, and that so suddenly, as to leave no room for supposing its effect could be owing to any other quality.

In short, it appears by the testimony of the best writers to be an approved remedy in all colicky † complaints, attended with

---

* Quisque ex junioribus medicis jam facile perspiciet ex omni remediorum genere, nullum tantâ valere efficaciâ tonum naturalem intestinalis canalis restituendi, ipsasque spasticas stricturas harum partium mitigandi, & motum retrogradum qui ad superiora tendit reparandi, & ad inferiora convertendi, quam calidum humidum & interius & exterius rectè adhibitum. Hoffman.

† Propter laudatissimum hunc effectum (antispasmodicum scilicet) balnea, in iis morbis qui identidem astricturâ & spasmo partium imi ventris proficiscuntur, præcipuum curationis punctum absolvunt. Hujus generis sunt omnes intestinorum dolores, tormina, atrox colica convulsiva.—Hoffman, de balneorum aquæ dulcis usu in affectibus internis.

Hippocrates advises the warm bath in the colic to procure a passage. De victu acutor. cap. lxi.

Vide Edinb. medical essays, vol. iii. p. 357.

Semicupia prosunt. Sauvage, colica biliosa, class. 7. g. 22.

Cælius Aurelianus advises warm bathing to be repeatedly used in this complaint, p. 261.

Utatur balneo calido. Celsus, remedia ad coli dolorem.

pain

pain and tormina of the inteſtines; provided always that proper evacuations by blood-letting be premiſed, ſhould any inflammation be preſent.

By the ſame quality it proves an effectual relief in ſeveral kinds of aſthma * of the ſpaſmodic ſort. **In the ſpaſmodic aſthma.**

It is likewiſe of the greateſt ſervice in calculous complaints, when any ſtony concretions are paſſing through the urinary paſſages, † eſpecially the ureters, which **In calculous diſorders.**

---

* Warm bathing is adviſed in the aſthma by Cælius Aurelianus.

Sauvage adviſes the uſe of warm bathing in the aſthma hypochondriacum, and aſthma convulſivum, and aſthma metallicum, which are of this kind.

Hoffman adviſes the uſe of the warm bath in the convulſive aſthma. De aſthmate convulſivo. Vol. ii. p. 100.

† Dolorem ſublevant balnea. Sauvage de Nephralgia calculoſa.

Balneatio bis in die neceſſaria eſt ante purgationem. Sauv. de nephritide calculoſa.

Aretæus adviſes the warm bath in ſuch caſes with this intention. Vide Curatio renum acuti affectus.

Peculiari etiam modo ſolatur eos qui a renali calculo magnos ſuſtinent cruciatus. Nam ſi paulo grandior anguſtis ureterum viis inhæreſcit calculus, ſpaſmi non modo ductus urinarios, ſed omnes quoque totius corporis partes nerveas penetrant. Nihil hic eſt conſultius quam corpus temperato balneo immittere, ut blando ejus tepore ſtricturæ & contractiones partium remittant. Hinc non modo dolor mitigatur, ſed & viis laxioribus redditis, facilior fit calculi tranſitus atque expulſio. Hoffman, vol. iii. p. 213.

often

often irritate ſo violently as to cauſe great pain and ſtrong convulſive contractions of the urinary ducts.

The warm bath allays theſe admirably; and by this means frequently procures a paſſage for the ſtone which could ſcarce be attained by any other means.

In ſpaſmodic ſuppreſſions of urine.

The warm bath has alſo been found of great ſervice on the ſame account in ſpaſmodic ſuppreſſions of urine; either ſymptomatic, as ſometimes happens in the colic, or in conſequence of ſome ulceration or ſtimulus (as from too violent diuretics, cantharides eſpecially) or from an original affection of the urinary organs.

In biliary calculi, and ſpaſmodic obſtructions of the biliary ducts

By the ſame means the warm bath proves an effectual remedy in promoting the paſſage of biliary calculi, which may be lodged in the gall ducts, * into the inteſtines.

---

* Sauvage adviſes a warm bath for this purpoſe. Noſol. Meth. Hepatalgia calculoſa.

Warm bathing ſeems to be recommended by Hippocrates with this intention. De locis in homine, cap. xii.

Celſus likewiſe adviſes the warm bath in this diſorder.—De regio morbo.

Temperate baths are adviſed by Hoffman to take off theſe ſpaſmodic contractions, and particularly to facilitate the paſſage of gall ſtones. De cachexia icterica, vol. ii. p. 233.

The

It is alſo of great efficacy in icterical caſes, when the biliary ducts are ſpaſmodically contracted and the paſſage of the bile obſtructed in that manner.

In * menſtrual obſtructions, when the ſtoppage happens, as is moſt commonly the caſe, from a ſpaſmodic affection of the uterine veſſels, the warm bath is frequently of great ſervice; eſpecially when proceeding from ſome ſudden and evident cauſe, as affections of the mind, cold, or ſome other external cauſe. In menſtrual obſtructions.

The warm bath has likewiſe been extremely ſerviceable in preventing miſcarriage, which frequently happens from thoſe ſpaſmodic affections of the uterine ſyſtem, which are apt to come on at certain periods during the time of pregnancy. In preventing abortion.

To this quality likewiſe is owing the good effect of the warm bath in the ner- In the nervous head-ach.

The hot bath is recommended by Cælius Aurelianus.—De aurigine.

* Hippocrates adviſes frequent bathing in hot water in menſtrual obſtructions. De morbis mulierum. L. II. cap. xxvii. Ibidem, cap. xxxviii.

Vide Van Swieten's commentary, vol. iv. p. 446.

Home, princip. medicinæ de menſium obſtructione.

vous

vous head-ach, eſpecially when it affects one part more than the other, as in the hemicrania.*

In muſcular contractions.

The warm bath alſo has been found eminently ſerviceable in rigid contractions of the muſcles.† Theſe often ariſe from various cauſes, but the warm bath has been found almoſt univerſally of uſe in them. It particularly relieves thoſe which follow fits of the gout or rheumatiſm, and are generally attended with conſiderable pain. It is likewiſe of the greateſt ſervice in thoſe contractions, which ſometimes ſucceed violent colics, eſpecially that of Poictiers, which ſeem to be of the paralytic kind.‡

Nor is the warm bath leſs efficacious as an antiſpaſmodic in diſeaſes of the ſyſtem

* Capitis gravitatem ſolvit. Hippocrates.

Vide Sauvage, Nos. meth. cephalæa melancholica.

Hoffman de balneorum uſu in affectibus internis.

Si ſiccitas & ſitis ſimul adſint, balnea potius ex uſu ſunt, quam agitatio ulla ſudorificis aut calidioribus medicamentis tentata. Fordyce de hemicrania.

Vide a remarkable caſe in the ſecond volume of Dr. Percival's eſſays.

† Sauvage, V. contractura dolorifica.

‡ Vide Tronchin de colica picton.

in

in general, than thoſe which more eſpecially affect a particular part. Inſanity, whether of the furious or melancholic* kind, has been greatly relieved by the warm bath; eſpecially thoſe caſes which are attended with a retention of the natural evacuations. In inſanity.

Epileptic diſorders † likewiſe, eſpecially thoſe which ariſe from, or are attended with, a ſuppreſſion of ſome of the natural diſcharges, or ſuch as the patient has been long accuſtomed to, are greatly relieved by warm bathing. In the epilepſy.

---

* Proſper Alpinus de medicina Egyptiorum, p. 115.

Dulcium balneorum uſus, ſi quid aliud, melencholicis opitulatur. Alex. Trallianus, l. i. p. 107.

Exemplo eſt inſania, ſive cum triſtitia, ſive cum furore juncta, ad quam tollendam balnea quam maxime conferunt. Familiare id morbi genus eſſe hypochondriorum vitio laborantibus, ubi nervoſæ imi ventris partes ſpaſmo conſtrictæ ſunt, nec excrementa dimittunt, ſummaque etiam cutis frigore, teſte ſpaſtica conſtrictione, affecta eſt. Non alia ſane balnea hic ſalutarem præſtant efficaciam niſi quod nervoſas partes conſtrictas emolliant, atque relaxent, cutimque ſtrictam & frigidam calido tepore aperiant. *Hoffman, de balneorum aquæ dulcis uſu in affectibus internis.*

Warm baths are adviſed by Boerhaave in this diſorder. Aphoriſm. 1114.

† Ita in epilepſia quæ in fæminis ex menſibus ſuppreſſis oritur, novimus balnea, aliis interpoſitis remediis, cum fructu uſurpata. *Hoffman, de balneor. aq. dulc. uſu in aff. internis.*

It

It St. Vitus dance.

It is likewiſe a probable remedy in a diſorder nearly allied to the foregoing, called St. Vitus * Dance, when proceeding from the ſame cauſe as above mentioned.

In hyſteric diſorders.

In hyſteric † diſeaſes, attended either with obſtruction of the menſtrual diſcharge, or fluor albus of an acrimonious kind, the warm bath is of great ſervice.

In hypochondriacal complaints.

Hypochondriac diſorders are alſo greatly relieved by the warm bath, as has been before obſerved in ſpeaking of it as a ſtimulant; but its antiſpaſmodic qualities are doubtleſs highly uſeful in this diſorder, as it is by univerſal conſent determined to be of the ſpaſmodic ‡ kind.

---

* Vide Sauvage, de Scelotyrbe chorea Viti.

† Vide Sauvage, hyſteria chlorotica. Hyſteria a Leucorrhœa.

Aretæus adviſes the warm bath in theſe caſes. De hyſterica ſuffocatione.

Neque vero tantum hypochondriaci, ſed & fœminæ hyſtericis pathematibus obnoxiæ, a balneorum uſu non neglectis internis remediis, deſideratiſſimum ſolamen atque allevamentum accipiunt. Hoffman, de balneorum uſu in affectibus internis.

‡ Hoffman aſcribes the good effects of the warm bath in this diſorder to its antiſpaſmodic qualities.

It

It is frequently too of great ſervice in the nervous atrophy,* attended with fever, which is in all probability owing to this quality. In the nervous atrophy.

I am likewiſe much inclined to attribute its uſe in *fevers* to the ſame cauſe.

Among the Antients, it was in great eſteem on this account; but among the Moderns, it has nearly fallen into total diſuſe in this diſorder. I ſhall not deny, that the Ancients probably uſed the warm bath too indiſcriminately in fevers, nor that its uſe was more allowable in a hot climate than in our own; but on the other hand I think we may ſafely affirm, that its uſe has been too much neglected among us in this as well as in many other diſorders.

It was in great eſteem among the Ancients in fevers in general, but eſpecially in intermittents.

---

* Utile eſt interdum balneum. Celſus de Atrophia.

Cælius Aurelianus adviſes repeatedly the uſe of the warm bath in this complaint.

This complaint ſeems owing generally to obſtruction of the lacteal ſyſtem, which may proceed from ſpaſmodic conſtriction, and be relieved by the warm bath. The effect of the warm bath in increaſing the abſorption of the nutritive parts of our food, has been obſerved by Proſper Alpinus, who relates, that it is commonly uſed in Egypt by the women, to render them more corpulent.

Its uſe in fevers.

intermittents. It was uſed by them either in the interval * of the fever, or imme-diately on its acceſs, † but never during its height. By the accounts we have from them, it muſt have been an efficacious re-

In intermittents.

medy in obviating the cold fit, (and of conſequence the diſeaſe itſelf) probably by taking off the ſpaſmodic rigor, which in a great meaſure conſtitutes it. It ſeems alſo to have been employed at the end of the hot fit, with a view to give a more com-pleat termination to the paroxyſm, which may be eaſily conceived from its relaxing and antiſpaſmodic qualities. Since the diſ-covery of the bark, the warm bath has fallen into diſuſe in this diſorder; but in-ſtances of its efficacy are not wanting in modern practice, even in caſes which had

---

* Quiſquis febre liberatus eſt, ſimul atque ex uno die non acceſſit, eo qui proximus eſt poſt tempus acceſſionis tuto lavari poteſt. At ſi circuitum habere ea febris ſolita eſt, ſic ut tertio quartove die revertatur, quandocunque non acceſſit, balneum tutum eſt.

Et in his quidem febribus quæ certum circuitum habent, duo balnei tempora ſunt alterum ante horrorem, alterum fe-bre finita. Celſus, cap. xvii. lib. 2.

† In prima febris acceſſione inclinante, ducendi in balneum omnes ſunt, tum pinguiter ſimul & molliter fricandi. Galen. Meth. Med.

Iterum

resisted the most celebrated * febrifuge remedies.

It appears to have been most successful when used according the antient method, just before the time of access of the paroxysm.

The warm bath was likewise of great use among the Antients in continued fevers, and their intention in using it seems similar here to the practice in intermittents. If circumstances allowed, they bathed their patients on its first access; but if this opportunity was lost, they cautiously avoided

In continued fevers.

Iterum lavacra calida ex aquâ potabili in tertianis, quia bilem educendo ejiciunt, neque nocent si bis in die usurpentur, etsi etiam coctionis signa non appareant. Galen, de Therapeia.

Tertianâ laborantibus balneum ut maximum præsidium adhibendum maxime, si quis calido & sicco temperamento præditus est, licet non prius cocta fuerit materia peccans. Alex. Trallianus, l. xii. p. 785.

* Felix Platerus, lib. ii. obs. p. 281.

When or whence it took its rise I know not; but yearly almost in the season I see intermittents cured by a method of bathing on the approach of the fits, and drinking daily a light steel water, and this when the disease has been of long standing; frequently relapsing, or is become anomalous, and the common febrifuges avail little. Few go without a cure, though somewhat tedious.——Appendix to Dr. Gilchrist on the use of sea voyages in medicine.

it

it while the inflammatory diſpoſition * was predominant; but, when that began to abate, they again uſed it with advantage; and this mode of uſing it ſeems highly juſtifiable both in theory and practice. At the firſt acceſs of the cold fit, and before the fever was formed, the warm bath was likely to be of great ſervice by its antiſpaſmodic quality, in removing that ſpaſmodic conſtriction which attends the acceſs of a fever, and in the opinion of many eminent men lays the foundation of the diſorder. If this opportunity was loſt, and the fever formed by the ſucceeding of the hot fit to the cold one, it muſt be obvious that a hot bath would be injurious on account of its ſtimulus, and moreover highly dangerous on account of its rarefying effects on the fluids, whoſe bulk and impetus were before preternaturally increaſed. When, however, the inflammatory diſpoſition

* Hippocrates de morbis mulierum, cap. lviii.

Celſus, cap. xvii. lib. 2.

In putridis febribus apud Ægyptios uſus eſt frequentiſſimus eo enim in omnibus tum continuis, exceptis peſtilentibus, tum intermittentibus familiariſſime utuntur non tamen in principiis ſed quando declinare cœperint.

Proſper Alpinus de Medicina Ægyptiorum.

has

has abated, and the remaining fever ſeems to be kept up (as frequently appears to be the caſe) by an increaſed irritability of the ſyſtem, from weakneſs cauſed by the diſorder itſelf, and the neceſſary evacuations; when ſtimulants and antiſpaſmodics are indicated to keep up the vis vitæ, the warm bath promiſes to be an excellent remedy; being moderately ſtimulant and cordial without inflaming; antiſpaſmodic without nauſeating the ſtomach; gently filling the veſſels without loading the organs of digeſtion; moderately promoting perſpiration, which ſeems to be the moſt natural criſis of a fever; not interfering with any internal medicine, and entirely at our command as to the continuation of its effects.

The warm bath is likewiſe of the utmoſt ſervice in that kind of low delirium which attends the advanced ſtate of a fever, and ſeems more owing to an affection of the brain and nerves than to inflammation, and which indeed ſeems often to proceed from inanition, as it frequently comes on where large evacuations have been uſed. **In febrile delirium.**

In theſe caſes, ~~the warm bath~~ has generally

rally

rally the moſt happy effects,* inducing a pleaſant ſenſation of the nervous ſyſtem, taking off the ſpaſmodic ſtricture on the ſkin, which generally attends this ſymptom, and thereby procuring a paſſage for the cutaneous evacuation, which generally gives great relief; procuring ſleep without the inflammatory effect of opiates; and frequently promoting the diſcharge of thick urine, by taking off the ſpaſm which affects thoſe organs, (ſo remarkably when the head is diſordered) the removal of which is ſo neceſſary to the cure.

In the ſmall-pox. The ſucceſs of warm bathing through the ſeveral ſtages of the ſmall-pox,† ſeems to

---

* Vide Dr. Gilchriſt, on the uſe of warm bathing in fevers. Appendix to the uſe of ſea voyages in medicine.—— All the cures he relates, wherein the warm bath was ſucceſsful, ſeem to have been of this kind, one only excepted, and even as to that there is ſome doubt.

Vide a caſe of this kind in Dr. Percival's works, vol. II. p. 207. and another, p. 210. ibid.

My ingenious and learned friend, Dr. Haygarth, has informed me, that he had a caſe of this kind wherein the warm bath was of the greateſt ſervice. The patient was bathed ſeveral times, and every time, except one, her reaſon returned as ſoon as ſhe was immerſed; and after the laſt time of bathing, ſhe gradually recovered without ſuffering one ſymptom of returning delirium.

† Magnas laudes meretur talis methodus per quam morbi moleſtiam & periculum minui conſtat. Van Swieten. Com. Aph. 1394.

Quo

to depend on the ſame principle, viz. on its taking off the ſtricture on the ſurface of the body, and by that means giving a free exit to thoſe cutaneous evacuations, which carry off part of the variolous matter without coming to ſuppuration. At the ſame time, it reſolves many of the puſtules, and thereby prevents the concomitant fever, which the generation of pus always occaſions.

The warm bath alſo has been found of great ſervice in fevers, attended with local inflammation, as in the pleuriſy, peripneumony, * and paraphrenitis. **In pleuriſy, peripneumony, and paraphrenitis.**

Quo magis ergo perſpirabilis eſt cutis, eo melius, cæteris paribus, & contra. Van Swieten. Com. 1394.

Hoc imprimis obſervavi, dum, omnem curam impendens unicæ ægræ nocte dieque ſpongiis aqua calida madidis foveri curavi cutim, ſic enim evidenter patuit plures reſolutas fuiſſe, paucas admodum ſuppuratas. Van Swieten. Com. 1394.

For a more full account of warm bathing in the ſmall-pox, vide Van Swieten. Com. 1394, and Fiſcherus de remedio ruſtic. variol. per balneum curandi.

The good effect of the pediluvium, ſo well known in this diſorder, and adviſed by Sydenham, is a great preſumption in favour of this remedy.

* Conveniunt autem (balnea) in totum magis peripneumoniis quam febribus ardentibus. Nam dolorem lateris & pectoris & dorſi balneum lenit, & ſputum maturum facit, & educit, & facilem ſpirationem reddit. Hippocrates de victu acutor. cap. xxxii.

Its uſe in theſe is extremely antient, and modern practice has confirmed the propriety of it. The ſame caution is neceſſary here as in ſimple fevers, not to uſe it 'till the feveriſh heat and inflammation be ſomewhat abated. When this is effected, it proves an excellent remedy for allaying the pain, taking off the ſpaſmodic ſtricture on the lungs, and thereby eaſing the breath, and promoting expectoration more efficaciouſly and ſafely than the gum reſins, ſuch as gum ammoniacum, which is frequently uſed for that purpoſe.

Tunc poſt tres vel quatuor dies, ſolutis febribus, adhibendum eſt lavacrum. Cælius Aurelianus, lib. II. cap. xviii. de pleuritide.

In lateris dolore ſi morbus ſe remittat, æger balneo utatur. Ægineta.

Concoctis jam affectionibus balneum citra periculum adhibetur, quum etiam ad expurgationem ſputorum quæ pleuriticorum & peripneumonicorum thorace & pulmone continentur maxime conferat. In iis ergo qui ſic affecti ſunt, balneum iterari nihil prohibuerit. Oribaſius, lib. x. cap. 7.

There is no caſe in which the warm bath ſeems to be more indicated, and to promiſe more relief, than the higher inſtances of pleuriſy and peripneumony, to which may be added, a paraphrenitis. It muſt far exceed thoſe partial bathings, ſo much recommended in theſe caſes; for applied to the whole cheſt, it will affect powerfully all the containing parts, cool more effectually the inflammation, and by relaxing kindly the vehement conſtriction, give greater freedom of reſpiration. Gilchriſt on bathing in fevers.

The warm bath is likewise succeſsfully employed in inflammations of the kidneys, either proceeding from calculi, or original affections of the part. It ſeems particularly ſuited to this complaint by the almoſt univerſal recommendation of it by both antient and modern practitioners.* The ſame caution as to its uſe is neceſſary here as in the foregoing, though perhaps not ſo immediately.

In the nephritis vera.

From its effect on the nervous ſuſtem, it ſeems a probable remedy in the * phrenitis, after due evacuation.

In the phrenitis.

---

* Hippocrates reckons four diſeaſes of the kidneys, all of them of the inflammatory kind, though differing in ſymptoms and degree. He repeatedly recommends the warm bath in all of them: De internis affectionibus, cap. 15, 16, 17, 18.—Quod ſi non febriant præſtat eos in balneum de ducere. Aretæus, Curatio renum acuti affectus.—Sæpe deſidere in aqua calida. Celſus, de renum morbis.

Baths are adviſed by Boerhaave, aph. 997. and by Van Swieten in his Commentary. Sauvage adviſes the warm bath to be repeatedly uſed in this diſorder after bleeding and purgatives.

Peculiari etiam modo ſolatur eos qui a renali calculo ſuſtinent cruciatus. Hoffman, de baln. uſu.

Ubi morbus inclinaverit ad balneum deducuntur. Præterea cum inflammatio infeſtat a balneis abſtinendum eſſe cenſemus. Ægineta, de renum inflammatione.

* Aretæus adviſes a bath, if the diſorder continues long and attended with a ſlow fever after evacuations. De curatione phreniticorum.

In the enteritis.

It has likewiſe, with the ſame precaution, been uſed with ſucceſs in inflammation * of the ſtomach and bowels.

In the hepatitis.

Inflammations of the liver † alſo are relieved by it, and the caution of premiſing evacuations, though proper to be attended to, is not ſo immediately neceſſary; as the liver is leſs ſenſible both of inflammation and ſuppuration than moſt of the other abdominal viſcera.

In inflammation of the bladder and uterus.

The warm bath alſo, cautiouſly uſed, proves an excellent remedy in inflammations ‡ of the bladder. It has likewiſe been

Sauvage adviſes the body to be waſhed with warm water in inflammations of the brain after bleeding. Vide Cephalitis.

Inter externa, omnium optima, balnea aquæ dulcis temperatæ. Hoffman, de febre phrenitica.

Vide a caſe which ſeems to be of this kind from an inflammatory angina, in which the warm bath was of great ſervice. Dr. Percival's works, vol. II. p. 207.

* Vide Van Swieten, com. vii. aph. 954.

† Celſus adviſes the warm bath in inflammation of the liver. De hepaticis.

‡ Balnea aquæ dulcis optimum doloris procurant lenimentum. Hoffman, de inflammatione veſicæ. Hippocrates, aphor. lv. aph. xii.

Semicupia are adviſed by Sauvage. Vide cyſtitis.

been uſed with great advantage in uterine * inflammations.

I ſhall now proceed to ſpeak of the warm bath as indicated on account of its diaphoretic qualities. As a diaphoretic.

Though I have referred the effect of the warm bath in fevers principally to its antiſpaſmodic quality, (which is indeed in a conſiderable degree the foundation of its diaphoretic one) yet its peculiar effect in promoting the laſt-mentioned evacuation (which is of ſo great conſequence in inflammatory diſorders) is not to be neglected; as there is no doubt of its being particularly ſerviceable in the above-mentioned diſeaſes. But there are ſome inflammatory caſes, wherein its diaphoretic quality ſeems to be principally of ſervice.

No complaint is more aggravated by obſtruction of the perſpiratory diſcharge than the

---

† Aretæus adviſes the warm bath here. De curatione ſuffocationis hyſtericæ.

Hippocrates adviſes a warm bath in this complaint. De morbis mulierum.

Hoffman recommends warm bathing here. De inflammatione & febre uterina.

In the rheumatism.

the rheumatiſm,* and none more relieved by the warm bath. This remedy is of the utmoſt ſervice in this diſorder, both when idiopathic, or primary and original in the conſtitution, or ſymptomatic as in conſequence of ſome other diſorder or occaſional cauſe. It ſeems to ſucceed beſt when uſed after the inflammatory diſpoſition has either abated of itſelf, or been diminiſhed by other evacuations.

In the gout.

I look upon the diaphoretic quality of the warm bath to be a principal foundation of its uſe in gouty caſes. I no not mean to deny the efficacy of the ſtimulus of warm bathing in reſolving gouty obſtructions, but ſhall reſerve that 'till I ſpeak of pumping,

---

* Boerhaave adviſes the warm bath in the rheumatiſm, aphoriſm 1493. As does Sauvage, vide rheumatiſmus.

Balneorum quoque, tam naturaſium quam artificialium, caute adminiſtratorum, uſus eſt inſigniſſimus. At vero neutiquam in principio aut in ſtatu morbi, ſed in declinatione potius ad reliquias morbi ex intimis ſedis ſuæ penetralibus moderato ſudore eliciendas. Hoffman, de doloribus & ſpaſmis partium externarum rheumaticis atque arthriticis.

Dr. Mead has laid it down in his Monita & Precepta Medica, that warm water, fomentations, and ſuch like, increaſe rheumatic pains by their relaxant quality; but it ſeems more probable, that this effect was owing to their ſtimulus and rarefaction of the blood and fluids, as being uſed before the inflammation was ſufficiently abated.

ing, which is generally uſed for that purpoſe, and wherein the ſtimulus of the water is more particularly exerted.

It ſeems to be the eſtabliſhed practice to uſe this remedy in the decline of the fit, or in the interval; but not during the inflammatory ſtate. When judiciouſly managed in this way, it often proves an admirable remedy, carrying off the remains of the gout by gentle perſpiration,* and by that giving a more complete termination to the paroxyſm than could be procured by any other means.

The warm bath likewiſe, on account of its diaphoretic quality, is an excellent remedy In the ſcurvy.

---

† Porro ad methodum tam præſervatoriam quam curatoriam, nihil ſecurius nihil accommodatius regimine diaphoretico, ſalutari conſilio procurato, inveniri poteſt. Nam ſi verum, uti eſt veriſſimum, quod ſanguis ſeroſus impurior, qualis maxime ex tranſpiratione prohibita redditur, cauſa antecedens & materialis paroxyſmorum podagricorum ſit, ipſa certe ſanior dictitat ratio quæ experientia confirmatur, atrocem hunc morbum quam optime & tutiſſime, facta liberialiori tranſpiratione, vel ea quæ ſecundum naturam ſit, reſtituta, eſſe remedium omnibus aliis ſuperius. Hoffman, de dolore podagrico & arthritico vero.

Sudorifera ex arte inſtituta plus proficere. Boerhaave, aphoriſm. 1272.

Suadeo certe uti ſemel in hebdomada hypocauſtum jejunus adeat. Carolus Piſo, ſect. v. cap. 2.

Tum, cum firma declinatio fuerit conſtituta adhibenda lavacra. Cælius Aurelianus, lib. v. cap. 2.

medy * in ſcorbutic complaints. It appears by the accounts given us by the beſt writers on this diſorder, that it rages moſt violently in circumſtances unfavourable to perſpiration, as in cold † weather and cold climates; and that it ſcarce ever appears in warm climates, except in the rainy ſeaſons; but that a combination of cold and moiſture diſpoſe particularly to it. Nor is this difficult to explain: for as perſpiration is the principal evacuation intended by nature for carrying off ſuch portions of our fluids as become acrimonious and prejudicial to health, on account of their tendency to putrefaction, (to which all animal ſubſtances

---

* Whatever promotes perſpiration is uſeful. Lind on the ſcurvy, p. 187.

† Its virulence will always be greatly augmented by the addition of cold. Thus we find it a much more frequent diſeaſe in winter than in ſummer, and in colder than in warmer climates. It is generally owing in ſouthern latitudes to the continual rains, which fall there at certain ſeaſons. But a combination of cold and moiſture is the moſt frequent and general ſource of this diſeaſe. Lind on the ſcurvy, p. 72, 73.

Certe geneſis ſcorbutici mali, quod non niſi maximus impuritatis gradus eſt, non aliunde quam ab hâc origine repetenda. Quo magis enim in humoribus vitalibus creſcit impuritas ex incongruis et minus temperatis aſſumtis, eo plus vigere debet excretionem, inque primis perſpirationis negotium, eoque ſufflaminato, eo gravior metuenda eſt noxa.—Hoffman, de damnis ex cohibitâ cuticulari excretione.

ſtances are particularly ſubject) it is plain what muſt be the conſequences when this evacuation is diminiſhed, and the putrefactive diſpoſition increaſed.

The warm bath here, by increaſing this evacuation in a mild and eaſy manner, contributes greatly to prevent the putrefactive taint from ſpreading and contaminating the animal fluids, by carrying it off as it is generated. Its proper uſe,* according to ſome writers, is either in the beginning or decline of the diſorder; but by no means when the putrefactive diſpoſition is ſo ſtrong as to form external ulcers. †

This caution ſeems well founded, partly on account of the old obſervation, that the warm bath was injurious to an open ſore, and moreover, becauſe, in that ſtate of the diſeaſe, the ſolids are ſo eaſily ruptured, that an hæmorrhage ‡ might be apprehended from the burſting of a blood veſſel,

* Warm baths are recommended by Dr. Lind, p. 200.—and by Boerhaave and Van Swieten, aph. 1161.

† Hoffman, de ſcorbuto ejuſque vera indole.

‡ Sauvage adviſes the warm bath, with this caution: Modo nullus hæmorrhagiæ ſit metus. Art. Scorbutus.

veſſel, cauſed by the ſtimulus and rareſying quality of the warm bath.

In the lues venerea.

To this quality is owing the well-known efficacy of the warm bath in the lues venerea.*

In the cholera morbus.

The warm bath is likewiſe of great uſe in the cholera morbus, in changing the determination from the inteſtines to the ſkin; a circumſtance of the greateſt conſequence in this diſorder.

In the colic.

By the ſame power it greatly relieves thoſe habitual colics and laxities of the inteſtines,† which are frequent among thoſe

* Sauvage adviſes the warm bath once or twice a day as a preparation for the mercurial unction. Vide Art. Syphilis.

Nunquam facile ſecundum noſtram ſententiam atque experientiam mercurialia modo ſalivationis modo evacuationis per ſudorem fine, ſive in lue venerea, ſive in aliis rebellibus morbis propinanda ſunt, niſi balnei uſus intercedat. Hoffman, de balneorum uſu.

Vide Boerhaave, aph. 1458. and Van Swieten's commentary on it.

† It has long been a received notion in phyſic, that the warm bath was prejudicial in laxity of the inteſtines, derived, I imagine, from Hippocrates,[c] who adviſes not to bathe in ſuch caſes. But this caution, I am certain, both from theory

[c] Minime vero tempeſtivum eſt, eos lavare quibus alvus in morbis liquidior juſto eſt. Hippocrat. de victu acutorum.

who change from a hot to a cold climate; and which obviously arise from a suppression or diminution of the perspiratory discharge.*

---

ory and experience, is too universally attended to.—In the putrid dysentery, and all purgings attended with symptoms of putrefaction,[d] this caution is very just and proper; but where no symptoms of this kind occur, the warm bath is an excellent remedy in restoring perspiration, which is always obstructed in these disorders, at least in their beginning, and at the same time abating the convulsive motions of the stomach and intestines. This consent of the stomach and intestines with the surface of the body, was well known to the Antients. Cutis siccitas alvi laxitas, is an aphorism of Hippocrates, and the restoring perspiration[e] has always been esteemed a principal point by all practitioners. Sydenham found in some fevers that the vomiting could not be checked but by producing a sweat. Nothing seems more safe or effectual in such cases than the warm bath, which is indeed recommended by some of the most eminent among the Antients. Celsus, Galen[f], and Aretæus, all advise the use of the warm bath in the cholera morbus; and Cælius Aurelianus[g] advises it to be repeatedly used in the same disorder, as long as the vomiting continues, in which case, as well as in purgings, it was forbidden by Hippocrates.[h]

* The perspirable matter checked suddenly and thrown back upon the constitution, is in all cases very apt to affect the

---

[d] Vide Sir John Pringle's works, p. 326.

[e] Sir John Pringle observed, that those were most liable to be seized with the dysentery, who, after a hot day, were exposed to the damps and colds of the night. p. 253.

[f] Tunc si plurimus (inquit) vomitus fuerit, lavandos ægrotos calida & post lavacrum, somno dimittendos. Galen.

[g] De cholera.

[h] De victu acutorum.

In the dysentery.

On this account the warm bath must be of great service in the dysentery, provided it be not accompanied with great inflammation, or tendency to putrefaction; and must far exceed, both as an antispasmodic and diaphoretic, the fomentations and partial baths generally recommended.

In the diabetes.

The diabetes * likewise has been greatly relieved by the same quality of the warm bath.

In the mania.

On the same account, as well as of its antispasmodic quality, it is of great service in † maniacal disorders; where this discharge

---

the bowels; and vice versa, I have more than once known a diarrhœa, which has resisted other remedies, yield entirely to the use of the warm bath. Dr. Baker. Med. Transact. vol. II.

* Van Swieten, with great propriety, makes it one of the principal indications of cure—Ut tota cutis superficies laxa & maxime perspirabilis servetur—And seems to approve of Celsus's[1] method of cure, who advises the warm bath for that purpose. Vol. II. p. 275.

† Hoffman makes the opening of the cutaneous pores one of the principal uses of the warm bath in maniacal disorders. De balneorum usu.

Aretæus advises a warm bath on the same account. Raræ enim mollesque carnes ad ægritudinis remissionem maxime faciunt, verum istæ in melancholicis aridæ sunt, & densæ. Curat. melancholiæ.

---

[1] De urinæ nimia profusione.

charge is very ſmall, and its reſtoration of the greateſt conſequence.

From the importance of keeping this diſcharge free in cutaneous diſorders, I imagine that this effect of the warm bath muſt be of great uſe in the cure of the leproſy,* and other diſorders of the ſkin. **In the lepra.**

I ſhall next ſpeak of the uſe of the warm bath with regard to its diuretic qualities. **As diuretic.**

I look upon this to be no ſmall cauſe of its efficacy in hepatic obſtructions. **In hepatic obſtructions.**

The good effect of gentle diuretics in theſe diſorders is well known; and the increaſe of this diſcharge is generally the firſt and beſt ſymptom of amendment that can occur. The warm bath, if made uſe of at the beginning of the complaint, while the obſtruction is recent, and before any inflammation is come on, is likely to ſerve this purpoſe admirably well; uniting in itſelf ſeveral qualities, all conducive to the cure

---

* Ingrediatur balneum per decemdies iterandum. Sauvage, art. Lepra.

Balnea vero aſſidue ad madefaciendum corpus & ad humores noxios perſpirandos proficiunt. Aretæus, curatio elephantiaſis.

cure of theſe diſorders: being mildly ſtimulant to the nervous and vaſcular ſyſtem without heating, and antiſpaſmodic without oppreſſing the ſtomach; two circumſtances of great conſequence in the removal of obſtructions. Moreover (as abſorbed into the body) it waſhes out the glandular ſyſtem, and at the ſame time promotes the urinary diſcharge; * which experience has ſhewn to be the moſt favourable for removing obſtructions of that kind.

In the ſcurvy.

From the good effects of diuretic medicines in ſcorbutic diſorders, we may infer, that this † quality of the warm bath is one cauſe of its efficacy in this complaint likewiſe.

In the ſcrophula.

It ſeems probable, that to the like quality is owing, in ſome degree, its good effect in the ſcrophula.

---

* Diuretics are adviſed by Celſus in liver complaints.—De hepatis morbis.

The good effect of gentle diuretics is taken notice of by Van Swieten. Non enim hic requiruntur acria diuretica ſed leniora tantum. Commentary on aph. 925.

† Urinæ ſcorbuticorum contentis ſaturatæ ſunt & acres, magnamque ſedimenti copiam ponere ſolent, unde videtur natura ipſa hanc viam indicare, ut ſanguis ab acrimoniâ in hæ ente depuretur. Van Swieten. com. §. 1164.

The

The relief of the * leprosy by warm bathing is in all probability owing, in some measure, to the diuretic as well as to its detergent and diaphoretic qualities. In the lepra.

The same property, no doubt, adds greatly to the efficacy of the warm bath in maniacal disorders, wherein this secretion is in general greatly diminished. In the mania.

But its principal efficacy this way is in calculous cases. One great cause of the generation of calculi, seems to be, the too long stay of the urine in the bladder before it is evacuated, by which it is in a manner decomposed, and lets fall a crustaceous sediment. This conjecture seems confirmed by the observation, that those people are more particularly subject to this disorder, who are obliged to retain their urine a long time; and it is not improbable, that one reason why malt liquor is more apt to breed calculous concretions than wine or spirituous liquors, may be, that it is less diuretic. In the Calculus.

* For the importance of diuretics in this disorder, vide Dr. Mead's Medica Sacra.

The warm bath furniſhes an excellent remedy in this caſe; being mildly diuretic, and at the ſame time antiſpaſmodic, whereas the things commonly uſed with this intention are often very dangerous or troubleſome, on account of their ſtimulus, which frequently excites pain or ſtrangury. Their effects too are much leſs under command than thoſe of the warm bath, which is indeed likewiſe in general the beſt remedy for the bad conſequences the former are ſo apt to produce.

As expectorant.

The warm bath may likewiſe in ſome circumſtances be of ſervice by promoting expectoration in peripneumonic complaints, wherein this diſcharge is the moſt natural and beſt termination. Its expectorant quality is here of conſiderable ſervice; eſpecially as it is not accompanied with the ſtimulating properties of moſt of the ſubſtances generally employed with that intention.

In the peripneumony.

In gouty coughs, & aſthma.

It is alſo of great ſervice on the above account in gouty coughs, and aſthma, when proceeding from a gouty cauſe; which are generally attended with a defect of this ſecretion, which warm bathing often promotes

motes in ſuch a manner as to carry off the fit eaſily and ſafely by that means.

In the ſpaſmodic aſthma.

Its uſe likewiſe in the ſpaſmodic aſthma, is probably in ſome degree owing to the ſame cauſe.

As ſialagogue.

I do not know any circumſtances to which the warm bath is particularly adapted on account of its increaſing the ſalivary diſcharge.

As emmenagogue.

As to the indication of the warm bath as an emmenagogue, I have ſpoken of it before when I treated of its ſtimulant and antiſpaſmodic qualities, to which I have referred this effect.

I now come to the ſecond head of this chapter, wherein (according to the plan laid down at the beginning) I propoſe to treat

Of MEDICATED BATHS.

Of medicated baths.

This ſubject is too copious to be fully diſcuſſed here; eſpecially, as I have before ſaid, I mean this part of the work only as introductory to, and explanatory of what I ſhall afterwards ſay concerning the external application of the Bath waters.

I ſhall therefore only attempt it in a general manner:

Medicated baths then, according to the definition formerly given of them, conſiſt of water impregnated with ſubſtances which impart their own proper qualities to it, and thereby render its effects on the body different from thoſe produced by common water.

Medicated baths, according to the preſent ſubject, may be conſidered in this place as of two kinds:

Artificial medicated baths.

Firſt, Thoſe prepared by art; and,

Natural medicated baths.

Secondly, Thoſe exhibited to us by nature as baths of native mineral waters.

Of what they may conſiſt.

As to the compoſition of theſe, whether natural or artificial, I think it may be ſafely laid down, that every ſubſtance that can be ſuppoſed to vary their effects, muſt be actually ſuſpended by the water in a ſtate of ſolution * or mixture. †

* Nothing in a ſtate of diffuſion can act on the ſurface of the body otherwiſe than mechanically, or be ſuppoſed capable of entering the pores.

† I know but one inſtance where the latter of theſe is likely to occur, which is in the union of oily bodies with

water

Artificial baths admit of a great latitude in this reſpect, as all the ſubſtances of the ſaline kind, many of the inflamable, and ſome of the metallic and earthy, and even aerial ſubſtances, are capable of being applied in this manner.

As to the firſt of theſe, ſolubility in water is their diſtinguiſhing characteriſtic. Every ſaline body therefore is capable of entering into their compoſition. Saline bodies.

As to inflammable bodies, ſulphur is judged not to be of itſelf ſoluble in water, and therefore in this ſtate cannot enter into the compoſition of a warm bath. But this does not affect it when rendered ſoluble by other ſubſtances, as alkaline ſalts or quick lime, in which ſtate it may form an efficacious ingredient. Inflammable bodies. Sulphur.

Oily ſubſtances * likewiſe, both expreſſed Oils and reſins.

---

water by means of an alkaline ſalt, which is probably a degree of chemical mixture, as appears from Sir Iſaac Newton's experiment on the ſoap bubble.

* Many eſſential oils and reſins, which are not by themſelves miſcible with water, when ſeparated from the vegetable are eaſily extracted from the vegetable itſelf, and retained, for ſome time at leaſt, in a ſtate of ſolution, or intimate mixture, eſpecially if heat be applied.

This is likewiſe the caſe with expreſſed oils, except that heat rather prevents than promotes their mixture with water.

ſed and eſſential, though immiſcible with water by themſelves, are capable of an intimate union with it by various means; and then may properly form an ingredient of medicated baths.

The like may be ſaid of reſins,* and gum reſins, which laſt are, in a degree, by themſelves miſcible with water.

Gums an mucilages.

The gummy and mucilaginous parts of vegetables are alſo capable of entering into their compoſition as being eaſily ſoluble in water.

Moſt of the efficacious qualities of vegetables may be referred to the abovementioned parts of their compoſition; but there are ſome others which we cannot ſo eaſily determine in what part of the vegetable they are lodged, which are nevertheleſs eaſily extracted by water, and as ſuch may enter into the compoſition of a warm bath.

Aſtringency of vegetables.

Thus the aſtringency of vegetables is eaſily extracted by water, and is an uſeful quality

* The ſolubility of theſe in water is owing, in a great degree, to the gummy and farinaceous ſubſtances with which they are frequently blended in the native vegetable.

quality in external applications of this kind, though we know not exactly in what part of the vegetable it is lodged.

Bitterness of vegetables.

The bitterness * likewise of some plants may be extracted in the same manner, though we are ignorant to what part of the vegetable to ascribe it.

Antiseptic qualities of vegetables.

The antiseptic qualities of vegetables also form an useful ingredient in our baths. These may be considered in two lights, either as general, (since all vegetable infusions in water are possessed of an antiseptic † power) or peculiar as when the particular quality of the vegetable is extracted. The latter of these is generally aimed at in external applications of this kind, though I doubt not that much is owing to the antiseptic quality common to all vegetables.

Spirituous substances.

Spirituous substances likewise, or fermented liquors, may (as easily miscible with

---

* This may seem an extraordinary quality to expect in a warm bath; but we should consider, that the efficacy of the Peruvian bark (which is proved to be very great in this way, vide Alexander's Essays, vol. I.) is probably owing to a combination of bitterness with astringency; both of which are necessary to be extracted to give it its full force.

† See Dr. Alexander's Experimental Essays, vol. II.

with water) enter into the compoſition of medicated baths.

Metallic ſubſtances.

Metallic ſubſtances alſo, tho' in themſelves inſoluble in water, may, by being reduced into a ſaline ſtate, become miſcible with it. Iron* is the moſt commonly uſed for this purpoſe; though copper, antimony, and cobalt are mentioned by ſome of the writers on this ſubject, as ſometimes entering into their compoſition.

Calcareous earth.

As to earthy ſubſtances, the calcareous earth is the only one that can enter into the compoſition of a bath, as being the only one ſoluble in water. I never heard of its being made trial of, though it is not improbable it might be applicable to ſome uſeful purpoſes.

Aerial ſubſtances.

Some aerial ſubſtances likewiſe are capable of intimate union with water, and on that

---

* Communiſſima horum & utiliſſima ſunt, quæ ex ſcoriis martialibus terreo—ſalina & ſulphurea martis ſubſtantia fœtis, concinnantur.

Præter hæc, in locis ubi metallifodinæ vigent, & minerarum cuprearum antimonialium & cobalti uber proventus, recepti uſus ſunt balnea quæ ex horum ſcoriis præparantur.

Hoffman obſervationes de thermis ad imitationem naturalium per artificium præparandis.

that account may be ingredients in baths. But fixible air is the only one that can, properly ſpeaking, be employed in an artificial bath. Fixible air.

As to natural baths, their impregnation is much more limited, ſince it is plain that nothing can enter into their compoſition except native * foſſile ſubſtances, and ſuch of thoſe only as water is capable of being united with, by ſuch means as we can ſuppoſe to exiſt in nature. Natural medicated baths.

For a liſt of theſe ſubſtances I ſhall refer to the firſt volume of this work.†

I ſhall now make a few obſervations on the comparative efficacy of baths of ſimple water, and medicated baths, with regard to fulfilling the indications for which they are required. Compariſon of medicated baths with ſimple water.

I ſhall take theſe in the order in which they are mentioned above.

Firſt, then, as detergent to the ſurface of the body. As detergent.

In

* Vide vol. I. p. 39.

† Vide vol. I. p. 194.

In this respect medicated baths have certainly the advantage of simple water; for by alkaline salts and saponaceous substances they may be rendered much more efficacious, in washing off the foulness caused by perspiration, which is always combined with an oily matter not of itself miscible with water: and though this is in some degree rendered miscible with the water by the substances with which it is united in the body, yet it is but imperfectly; and therefore not near so easily washed off by simple water as when that is united with alkaline salts or saponaceous bodies. Yet these substances should be tried with great caution; for, if used in too great quantity, they are apt to wash out the oily matter which is lodged in the cutaneous pores for the purpose of keeping the cuticle soft and relaxed, and by this means cause it to become hard and rigid; by which means perspiration would be obstructed, and our sense of feeling impaired.

On this account the Antients, with whom warm bathing was a frequent exercise, and who staid long in the bath, and used much friction likewise, by which means this oily matter must be rubbed out

from the pores, in order to ſupply the want of it, introduced the uſe of oils, and other applications of the like kind, to the ſkin after bathing, to keep it lax and ſupple.

As to the uſe of the warm bath on account of the abſorbtion of the fluid into the ſyſtem, and thereby diluting the lymphatic humours, diſſolving lentor and acrimony, and waſhing out the glandular cavities, (indications frequently occurring in glandular obſtructions, the ſcrophula, and the lues venerea) I think that a warm bath of pure water would be preferable to any medicated bath, as it is likely to be abſorbed into the ſyſtem in greater quantity, as being leſs ſtimulant; and thereby alſo leſs liable to irritate the nerves; a circumſtance of great conſequence in glandular obſtructions, where inflammation and ſchirrhus are ſo apt to follow irritations. Moreover, as the fluid is not loaded with any ſubſtance diſſolved in it, its power as a menſtruum would be greater in diſſolving the viſcid and acrimonious parts of the animal fluids. As abſorbed into the ſyſtem, and there as diluent and diſſolvent of lentor and acrimony.

As ſtimulants, medicated baths are much more efficacious than ſimple water, both in As ſtimulant.

in their effects on the surface, and as absorbed into the system, since they not only possess all the mechanical powers of common water, but also the specific qualities of the substance with which they are impregnated. Infusions of aromatic * plants and woods, † those especially containing a large proportion of essential oil, are generally used for this purpose.

If a more powerful stimulus, to the surface especially, be required, a strong solution of any neutral salt (common salt particularly, as being the cheapest and most easily procurable ‡) may be used. Nor do I see any reason why an infusion of cantharides, which impart their efficacy easily to water, may not be made trial of

* Hoffman advises baths of infusions of rosemary, wild thyme, and origanum, in languor and weakness of the external parts. De præstantia remediorum domesticorum.

Baths of infusions of aromatic herbs are advised by Van Swieten in cachectic disorders, to correct the relaxing effects of warm water only. Aphor. 661.

† A bath of this kind is recommended by Baglivi—de Fibra Motrici, p. 415.—and by Fuller Pharmacop. Extemporanea, p. 22, in the palsy.

‡ A saturated solution of common salt in water is frequently applied with success as an epithem in rheumatic complaints, and if long continued on the part will raise a blister like cantharides.

of, especially in topical baths, in cases wherein a strong stimulus is required.

I have likewise observed some mineral waters have this effect in a greater degree than common water, owing in all probability to their aerial impregnation; which, (as being intimately combined with the water by solution) we may easily suppose to be absorbed into the system along with the fluid, and there exert its stimulus on the nerves and blood vessels. I will not deny that this is possible to be imitated by art,* but the uncertainty of the operation, with the trouble and expence attending it, render it not very likely to be made trial of, except where we have no mineral waters of the kind within any reasonable distance.

Medicated baths have also the advantage over simple water in some respects as antispasmodics. As antispasmodic.

In

* A great difficulty in making an artificial bath impregnated with fixible air would be, that it is almost immediately dissipated by heat, and therefore would require a constant supply, which could only be had conveniently from a current of a spring thus impregnated.

In cafes where ftimulant medicines can be born or ufed with advantage, as in many nervous affections, where the heat and circulation are either little affected or below the natural degree; or where none or but a fmall degree of fever or inflammation is connected with the fpafm, as frequently happens in the biliary calculus, and fometimes in the paffage of ftony concretions from the kidneys to the bladder through the ureters, and from the bladder through the urethra, and in fpafmodic conftipations of the bowels not attended with inflammation; in thefe and fuch like cafes, I fay, medicated* baths are likely to be preferable to fimple water: but in cafes wherein the circulation and heat are increafed much beyond the ufual point, I fhould think fimple water preferable; becaufe all our antifpafmodic impregnations (if made ftrong enough for us to expect any benefit from them) are attended with a confiderable degree of ftimulus or opiate quality, both of which would render them highly

* Vide, a receipt for a bath of this kind in Hoffman, vol. ii. p. 346.

highly * improper at a time when the inflammatory diathesis was predominant.

The substances generally used to impregnate the water for this purpose, are the aromatic and fœtid plants, when a stimulus is required to be joined to the antispasmodic quality; and those of an opiate kind when a † sedative effect only is indicated. ‡ These are boiled or infused in water 'till their virtue is extracted.

Mineral waters likewise, abounding with fixed air, have this effect in a considerable degree, but combined with a great degree of stimulus, which renders them improper in inflammatory disorders.

Whether sulphur possesses any quality of this kind in external application, § I am

---

* Perhaps nitre may be an exception in this case, as it diminishes the impetus of our fluids by a kind of sedative power, and at the same time possesses antiphlogistic qualities.

† Sometimes these are united with good effect.

‡ For a formula for a bath of this kind, vide Gaubius de formula medicamentorum, intended to be used in the stone. p. 299. It is taken from Boerhaave. There is likewise a pediluvium of the same kind. p. 301.

§ Hoffman attributes an antispasmodic quality to a bath made from antimonial scoriæ, which he ascribes to the sulphur.—

not certain; though, from its known effects in pervading the ſmall veſſels, when outwardly applied, I ſhould think it not unlikely to anſwer upon trial. Some warm ſulphureous mineral waters are famous for their effects in this way; but we are not certain to what part of their impregnation it is to be aſcribed, as they are at the ſame time impregnated with fixed air in large proportion.

As diaphoretic.

I am not clear if medicated baths are more efficacious than ſimple water in promoting perſpiration. Stimulant ſubſtances taken inwardly, we know, have this effect; and it does not appear improbable, that their external application may in ſome circumſtances promote it likewiſe. They ſeem moſt likely to ſucceed when the pulſe and heat are below the natural degree, and when the vital powers are weak and inert. Perhaps it is owing in ſome degree to the ſtimulus of the fixible air conſtrained in them,

---

phur.—Antiſpaſticam proinde ex his parati tribuimus balneis efficaciam, dum ſcilicet ſulphur illud antimonii, per aquam diſperſum, fibrarum emollit ſtricturam, quæ cum fuerit nimia, conſtituit ſpaſmum, & tandem maximum efficit toni gradum: nimirum convulſiones. Hoffman de balneorum artificialium ex ſcoriis metallicis uſu medico.

them, that ſome warm mineral waters produce ſuch a plentiful perſpiratory diſcharge on bathing in them.

Sedative ſubſtances have likewiſe the ſame effect inwardly taken, and perhaps might ſucceed externally applied; but this I have not had an opportunity of confirming by experiment.

Perhaps a combination of ſtimulant with narcotic or ſedative impregnations, would be more efficacious than either of them ſeparately, analogous to their effect inwardly taken.

If any impregnations of water have a pretence to a peculiar or ſpecific effect of this kind, I ſhould think the ſulphureous ones had the beſt claim from the well-known power of ſulphur of entering the minuteſt veſſels: and moreover, it ſeems to have a peculiar affinity with the perſpirable matter, as the cloaths and linen of thoſe who take it inwardly are ſtrongly impregnated with it.

Perhaps the efficacy of ſulphur in ſome cutaneous diſorders, may be owing to this cauſe. Whether any artificial impregna-

tion of a bath with * antimony or mercury, would have the same effect, I am not able to determine.

As diuretic.

As diuretic, artificial baths are likely to be much more efficacious than simple water. The effects of the latter in this way are rather consequential or secondary than directly so; but by impregnating it with diuretic substances, the warm bath may be made to exert a specific action of this kind on the urinary organs, as well as its general quality.

The substances most likely to succeed in this way, are neutral salts; nitre † especially, dissolved in the water of the bath; infusions

* The efficacy of some of the artificial baths mentioned by Hoffman, as made with the scoriæ of metals, seem more owing to their sulphureous impregnation than their metallic one.

† Dr. Alexander found (vide experiment ix. vol. I. p. 31) that the external application of a solution of nitre was more diuretic than when the like substance was taken internally. This might suggest an useful hint in practice to employ diuretics *externally*, when such evacuation is required, alternately with their *internal* exhibition; which would prevent their loss of effect by habit; a circumstance so much complained of in the trial of these and other stimulant medicines, especially in dropsical cases.

I have myself frequently observed a diuretic quality in a pediluvium made with a strong solution of nitre in water.

infuſions of terebinthinate woods, as thoſe of the fir and pine kind, the like of their berries, cones, and buds, as juniper berries, fir tops and buds. I have alſo obſerved the ſame effect from ſome mineral waters, which is in all probability owing to their aërial impregnation, as no other ſubſtance of a diuretic quality, equivalent to the effect produced, could be diſcovered in them.

As expectorant.

How far the expectorant quality of the warm bath may be increaſed by addition of other ſubſtances, I have ſome doubt. To me it ſeems probable, that in ſpaſmodic affections of the lungs, and in other caſes where this diſcharge requires ſtimulant ſubſtances, ſuch additions may be of ſervice; but in inflammatory caſes, I ſhould think ſimple water greatly preferable, as poſſeſſing an antiſpaſmodic and relaxant quality, without the ſtimulus of the ſubſtances neceſſarily employed as antiſpaſmodics.

As demulcent.

Whether any additional ſubſtances can increaſe the demulcent quality of warm water externally applied, I know not; as I have not ſeen any experiments made on

them to prove whether ſubſtances of that kind were capable of being abſorbed into the body along with the water; but, a priori, as they diſſolve compleatly in water, I ſhould think it very probable; and if ſo, it would be an excellent method of exhibiting gummy and mucilaginous ſubſtances, when we want to abate the ſtimulus of the urine; ſince, if thus abſorbed, we ſhall have full as much probability of their being conveyed to the urinary organs as if given by the mouth.

As ſiala-gogue.

As to the effect of the warm bath in increaſing the ſalivary diſcharge, I know no additional ſubſtances that are likely to add to its efficacy, nor any particular circumſtances in which this evacuation would be likely to be indicated by ſuch means.

As emmenagogue.

As emmenagogue, I am inclined to think that additional impregnations might greatly increaſe this effect of ſimple warm water. It is well known that many ſubſtances, powerfully emmenagogue, may by theſe means be introduced into the courſe of circulation, and act upon the nervous and vaſcular ſyſtem as well as when internally adminiſtered. The uſe of theſe ſub-

ſtances

ſtances then in this way muſt be a valuable addition to phyſic. But, as the obſtruction of this evacuation proceeds from very different, and frequently oppoſite cauſes, regard muſt be had to theſe in our exhibition of remedies of this nature. If the obſtruction proceeds from languor, ſtimulant ſubſtances will be moſt proper; as infuſions of aromatic plants, ſtrong ſolutions of ſaline ſubſtances, or metallic ſalts,* iron eſpecially, or mineral waters abounding with fixt air. If from ſpaſmodic affection unattended with fever, infuſions of aromatic or fœtid † plants, or ſolutions of the fœtid gums, or gum reſins, or of the terebinthinate woods, (as of the fir or pine kind) or of the bitter and aſtringent combined, (as of the Peruvian bark) are proper. Sulphureous or chalybeate mineral waters will likewiſe probably be very effectual. If from feveriſh ſpaſm (as often occurs in the hectic fever) I ſhould

* Hoffman relates a caſe of a woman that was relieved by a bath of this kind in a menſtrual obſtruction. Vide Hoffman, de balneorum artificialium ex ſcoriis metallicis uſu medico.

† A formula of this kind may be ſeen in Boerhaavii Materia Medica quæ ſerviunt aphoriſmis, §. 75. No. 6.

I ſhould think pure water preferable to any admixture. If from general relaxation, aſtringents will be adviſeable, amongſt which infuſions with a gentle heat of ſome of the woods or barks, oak bark particularly, ſolutions of metallic ſalts, as of iron and copper, and of the earthy ſalts as alum.

If the obſtruction proceeds from aſtriction of the uterine veſſels or ſyſtem in general, owing to rigidity, opiates and relaxants will be proper, as infuſions of poppy heads, &c. though I cannot ſay I believe this is often a cauſe of the retention of this evacuation.

So far as to the compariſon of medicated baths with ſimple water, with reſpect to the qualities which they in ſome meaſure poſſeſs in common with one another.

But medicated baths have a conſiderable advantage in being endued with ſome properties to which ſimple water has no pretence.

As antiſeptic.

Thus medicated baths may be impregnated with an antiſeptic quality, not only affecting the ſurface, but the habit of the body, which is in both reſpects oppoſite

to

to the effects of simple warm water, which has been generally supposed to dispose the body to putrid disorders.

The substances most likely to succeed in this way are, in my opinion, as follows: Nitre,* that is, if any considerable degree of fever be present, as it possesses at the same time a cooling quality.† But if the vis vitæ be depressed with great muscular relaxation, which frequently happens in putrid fevers, infusions of the aromatic plants and of the vegetable astringents, as oak bark; and, if a greater degree of it be necessary, some of the mineral astringents may be added, as alum; and if the depression be very great, a portion of some spirituous liquor may be joined with the infusion of the vegetables, when the heat is abated. But the most efficacious antiseptic of any is the Peruvian bark,

* For an account of the effects of some of these substances externally applied in this way, and the advantages likely to accrue from their use in putrid disorders, vide Dr. Alexander's Experimental Essays, vol. I, essay the 1st.

† I have not here set down sea salt, as its power as an antiseptic is very weak; but I am inclined to think that sea bathing is often of service on this account, especially in external affections.

bark,* which is a combination of bitterness with astringency, and far exceeds all the others both as inwardly taken and externally applied. An infusion of it in water with a moderate heat, seems to me the best method of using it, to which, if intended to keep some time, a little spirit might be added, or, if we desire to render it more astringent, a little alum. If camphor could be rendered soluble in water, much might be expected from its great antiseptic power. In chronical cases, as in scorbutic complaints, the native or artificial sulphureous and chalybeate impregnations may be of service, as may likewise mineral * waters impregnated with fixible air.

As astringent.

Astringency likewise is a quality which simple water does not possess in the smallest degree,

---

* Dr. Alexander advises the use of nitre joined with the bark as an antiseptic, which he thinks may mutually assist each other's operation.

If accompanied with much fever, I should think such addition very proper, otherwise not, on account of the effect of nitre in diminishing the force of circulation, which in such cases it is necessary to keep up.

* Some mineral waters contain the three last-mentioned ingredients, and are found very serviceable in complaints of this kind.

degree, but is capable of being imparted to it in high perfection in medicated baths; and is found in some degree in the natural as well as the artificial impregnations. Of the former of these are, first, the waters that contain copper in form of blue vitriol, of which there are some, though but few instances; secondly, chalybeats of every sort, especially those with the vitriolic acid; and, thirdly, the aluminous impregnations; which are all of this kind that possess this quality. But as the first of these is exceeding rare, and the last seldom found of sufficient strength to be depended on in external applications, the chalybeate impregnations are the only ones of the native kind from which this effect is in any degree expected.

Some other native impregnations indeed possess a tonic quality, but this is in consequence of their stimulus, as they are not directly or properly astringent.

Artificial impregnations of this sort are very numerous, but the most effectual and convenient, in my opinion, are among the vegetable, such as infusions of the astringent woods and barks, oak bark especi-

ally,

ally, or the wood itſelf, or the bark of the aſh or horſe cheſnut, which are both ſtrong aſtringents, though not ſo much as the oak, and more compounded with other qualities. Of the mineral kind, a ſolution of alum or of green vitriol may be conveniently uſed for this purpoſe, or a mixture of the former of theſe with the vegetable aſtringents. If green vitriol be employed, the vegetable aſtringents will be leſs proper to be joined with it, as they precipitate iron from all its ſolutions, in acids eſpecially.

Some writers have recommended the uſe of ſolutions of copper * in the way of baths, to anſwer the purpoſe of aſtringents; but I never had any experience of their uſe in this way, and ſhould think them likely to be dangerous unleſs cautiouſly managed.

Lead likewiſe is a powerful aſtringent, but when diſſolved by acids, is too dangerous

† Vide Hoffman, de balneorum artificialium ex ſcoriis metallicis uſu medico; where he relates a caſe of a perſon who was violently afflicted with the herpes exedens, which ſpread all over his body, and who was cured by a bath of this kind.

rous even for external uſe.* Whether zinc might be thus advantageouſly employed, I know not; but I ſhould think it rather ſuſpicious, as it appears to poſſeſs ſome qualities ſimilar to thoſe of lead.

Whether cathartic ſubſtances might not ſometimes be employed advantageouſly in this way, I have ſome doubt. It is ſaid that the external application of cathartic medicines to the abdomen, as is ſometimes done to children for the worms, has proved purgative in a high degree. But, on the other hand, I never found this excretion increaſed by ſea bathing, even when the water was warmed. Whether ſome of the other kinds of purgatives might be more powerful in this way than the ſaline ones,† I cannot determine; but ſhould think it far from improbable that the alvine excretion might be thus excited as well as that by the kidneys. If ſo, it might often be of As cathartic.

* Vide Dr. Baker on the poiſon of lead. Medical Tranſactions, vol. I. II.

† Sea bathing will often prove aperient; but this ſeems only in conſequence of its action as a cold bath, and not owing to any ſpecific quality of the ſalt contained in it, as bathing in a common cold bath will have the ſame effect.

of great ſervice in many inteſtinal diſorders, where the ſtomach is too irritable to retain what is taken by the mouth long enough to produce its effect, and clyſters cannot be thrown up ſo high as to reach the ſeat of the complaint.

Contra Indications of the WARM BATH.

Contra indications of the warm bath.

I ſhall next proceed to make ſome remarks on the circumſtances in which the warm bath appears contra-indicated, and to give ſome cautions relative to its uſe; and theſe I ſhall deduce from its known effects on the human body; on the informations on this head derived from experience, and the accounts given us by writers on the ſubject.

Firſt, then, as to its mechanical action on the ſurface of the body.

Warm water applied to the ſkin ſoftens and relaxes the part, and is on that account very properly forbidden in open * ulcers, eſpecially in thoſe where the digeſtion is bad,

* Balneum quoque dum vulnus parum purum eſt, inter res infeſtiſſimas eſt. Nam id tumidum atque ſordidum reddit. Celſus, l. v. cap. 26. §. 28.

bad, or ſymptoms of putrefaction appear. The latter of which the warm bath, by its increaſing the heat of the part, and relaxing † it at the ſame time, ‡ is apt to promote.

The above reaſon holds ſtronger againſt employing it when there is any tendency to gangrene. § I imagine, for the ſame reaſon, it has been likewiſe ſuſpected of increaſing the diſpoſition of the body in general to putrefaction, and has on that account been forbidden in contagious‖ and putrid fevers; yet its good effects in the ſcurvy * have been acknowledged by ſeveral of the moſt able writers on the ſubject; though

† Cutis duræ mollities, diſtentæ laxatio. Hippocrates, de humidorum uſu.

‡ Some caſes are exceptions to this; as thoſe wherein the inflammation and ſtimulus are conſiderable; as in ſome cancerous complaints, particularly of the uterus, which cannot well be reached by applications in any other form, wherein the relaxing and ſedative effects of the warm bath are often of great ſervice. I ſee it ſometimes adviſed in ſuch caſes by Boerhaave.

§ Celſus cautions againſt the uſe of the warm bath in gangrene, l. 5. cap. 26. §. 34.

‖ Vide Sir John Pringle's works, p. 326.

* Hoffman cautions againſt the uſe of the warm bath in the ſcurvy, if any external marks of putrefaction appear.

though this diſorder is undoubtedly of the putrid kind. Perhaps the proper diſtinction may be, that in thoſe caſes where its ſtimulus can be borne, and the increaſe of the diaphoretic ſecretion is of ſervice, as in the ſcurvy, which is moſtly cauſed by the diminution or ſuppreſſion of this evacuation, there the warm bath is likely to be ſerviceable; but where theſe are prejudicial, as in putrid or malignant fevers, wherein this evacuation is already too much increaſed, there it is likely to prove detrimental. This objection does not affect medicated baths, if properly impregnated with antiſeptic and aſtringent ingredients.

The warm bath is ſometimes productive of bad effects from its rarefying qualities. Thus it is extremely dangerous in all caſes where a conſiderable degree of plethora prevails, and ought never to be ventured on before that is reduced within proper limits.

Moſt of the ſudden deaths which have been obſerved to follow warm bathing, are in all probability owing to a rupture of ſome veſſel in the head from inattention to this circumſtance. Nor is the

the warm bath only dangerous on this account in cafes wherein an actual plethora prevails, but likewife in cafes where an artificial or temporary one is prefent, as in the cafe of inflammatory fevers, wherein its ufe would probably be productive of dangerous effects, as well as in the laft-mentioned circumftances. It is likewife very dangerous in the temporary plethora, which is caufed by repletion, or taking in a large quantity of food, either of the liquid or folid kind.

Juvenal, with great probability, attributes many of the fudden deaths that happened in his time to the cuftom of bathing too foon after eating.* The like may be faid of its ufe too foon after taking in a large quantity of liquids, efpecially of th fpirituous kind.

The warm bath is likewife imprope cafes where, although no actual ple prevails, yet where the fudden incr the bulk of the fluids would be a with danger. Of this kind are

* Turgidus & crudum pavonem in baln
Hinc fubitæ mortes. JUVE

hages, which it is found to excite very greatly.* And as those who have been once affected in this manner generally continue subject to them during their lives, in some degree, if the hæmorrhage is of the internal kind, especially the stomach; in such cases the warm bath † is not to be ventured on, but with the greatest caution.

For the same reason, the warm bath is improper in immoderate menstrual discharges, which it very powerfully promotes by its stimulus and rarefying qualities, and, by its relaxing ‡ effect likewise, prevents the contraction of the mouths of the vessels, and of consequence increases the discharge.

The

---

* Hippocrates cautions against the use of the warm bath [illegible]ch cases.

† It is obvious that this caution is not meant to extend to [illegible] wherein we want to excite a discharge of this nature, [illegible] the hæmorrhoids, or from the nose, as in such cir[illegible]es its rarefying effects would promote such intention, [illegible]ocrates expressly advises it to those who have been [illegible] bleeding at the nose, which has prematurely stop[illegible] to bring it back.

‡ [illegible]t of warm water in increasing the flow of blood [illegible] wound, by preventing the contraction of the [illegible] formation of a thrombus, or clot of coagu[illegible]ll up the orifice of the bleeding vessel, is [illegible]ding in the foot, where, without the as[illegible]ter, little blood can be procured.

The warm bath alſo, though of great ſervice in the ſcurvy when not very far advanced, muſt, I ſhould think, be dangerous on this account in a very high degree of the diſorder, as the ſolids are then very tender and friable, and the veſſels very eaſily ruptured, as we know by experience. A ſudden increaſe of the bulk of the fluids, attended at the ſame time with a conſiderable degree of ſtimulus, could not, in my opinion, be void of danger, eſpecially ſince hæmorrhages in ſuch a ſtate are extremely difficult to be reſtrained.

Though the warm bath has been deſervedly commended in diſorders of the brain, particularly of the maniacal kind, yet I think great caution ſhould be uſed in this reſpect, as I ſhould apprehend in caſes where any conſiderable degree of inflammation of the brain or its membranes had taken place, it might be dangerous both by its rarefying qualities, and the ſtimulus or irritation it occaſions, which ſeems to affect the head particularly.

I ſhould likewiſe be apprehenſive of this effect of the warm bath proving pre-

dicial in * phthiſical complaints, which are found by experience to be eaſily excited by any increaſe of the circulation, or any ſtimulus of the inflammatory kind. The tendency to hæmorrhage from the lungs, (which almoſt always accompanies this complaint) renders the warm bath rather dangerous, for the reaſons before given.

As the quality of which I have juſt treated is common to all baths, whether medicated or not, it is evident that in the above-mentioned caſes they muſt both be equally contra indicated.

The warm bath, in ſome inſtances, may be contra indicated on account of the abſorption

* A late ingenious writer, (Dr. Parr, vide his Theſis, printed in 1773) has cautioned againſt the uſe of the warm bath in thoſe who are either afflicted with the aſthma, or have formerly laboured under it, on a ſuppoſition of its increaſing the diſorder by rarefying the air in the cheſt, and thus occaſioning more frequent inſpiration.

That this reaſon has ſome weight, I do not deny; but am well ſatisfied its antiſpaſmodic qualities are more than ſufficient to counter-balance any effects of this kind. I have had experience of this remedy ſeveral times in this diſorder, and always found it gave great relief; and have the ſatisfaction to find ſuch a practice is conſonant to that of ſeveral of the moſt eminent writers. The relief of the peripneumony by the warm bath, which is atteſted by many of the beſt writers, both antient and modern, is a ſtrong confirmation of this, as the increaſing the difficulty of reſpiration would be here full as dangerous as in aſthmatic complaints.

ſorption of watery fluid, to which it gives occaſion. Thus in dropſical complaints, where the cellular membrane is filled with water, and much frequently collected in other cavities of the body, as the abdomen cheſt, &c. and the ſkin itſelf in a bibulous ſtate, a warm bath would ſeem likely to be highly injurious in increaſing the quantity of watery fluid, already augmented to a noxious degree.

I have likewiſe ſometimes found the warm bath injurious by its diaphoretic quality. When this diſpoſition is preternaturally increaſed, as in the hectic fever, and ſome other caſes of great debility, I think I have ſeen manifeſt injury done by the uſe of the warm bath, which in ſuch caſes ſeldom fails to increaſe this ſecretion, already too great. I imagine, likewiſe, that this quality of it is no ſmall cauſe of its bad effects in putrid diſeaſes.

OBSERVATIONS *and* CAUTIONS *relative to the Uſe of the* WARM BATH.

I ſhall next make ſome obſervations, and propoſe ſome cautions, relative to the proper method of uſing the warm bath.

As to the degree of heat.

First, then, as to the degree of heat.

I have before mentioned the degrees of heat which are included in the denomination of a warm bath. Theſe, it is evident, muſt be varied according to the effect we deſire to produce.

If the warm bath be uſed as a detergent only, it is not very material what degree of heat is employed, as any of them within the limits above mentioned will ſerve the purpoſe equally well.

The like may be ſaid, in ſome reſpects, as to its effects when abſorbed into the ſyſtem, in diluting the lymphatic humours, waſhing out the glandular cavities, and diſſolving ſaline acrimony, as, when it is once abſorbed into the body, it muſt be ſoon reduced to the ſame temperature.—But it muſt ſtill be obſerved, that a degree of heat, rather above than below that of the human body, is moſt favourable to abſorption, as I have found by experience; and therefore I ſhould imagine, as the quantity abſorbed is here of conſiderable conſequence, that the degree moſt favourable to this would be moſt eligible. Perhaps

haps this may vary in different constitutions; but, by what I can discover, from 98 to 104 degrees of heat is most likely to succeed in such cases.

As to the rarefying effects of the warm bath on the fluids, no precise point can be fixed; but by the best experiments it does not appear, that any external signs of this appeared until the heat was raised to 98 degrees, and was even very moderate at 100 degrees; but after that, the external marks of the rarefaction of the fluids became very observable.

In cases, therefore, wherein this point is aimed at, I apprehend the heat should be at least 96 degrees,* yet I would not advise it much above 100, as in such cases, the strength is generally impaired, and the patients might find themselves, perhaps, more weakened or exhausted by the heat

* Vasorum in cute moles, sive in partibus aqua immersis, sive in ipso vultu, nequaquam increscebat, 96 deg.

Vultus tumor, & rubor exiguus, 98 deg.

Facies tumida, & rubra erat.—Vasorum moles vix augescebat, 100 deg.

Turgebant vasa, facies multo magis rubra & tumidior erat, 102 deg.

Maxime turgebant vasa, facies ruberrima erat, 104 deg.

and evacuation, than relieved by filling the veſſels in this manner.

If the ſtimulant qualities of the warm bath are deſired in any conſiderable degree, as in the palſy, the heat ſhould be as great as the patient is capable of enduring. Few can bear above 106 degrees at firſt going into it, but afterwards the heat may be increaſed (which ſhould always be done pretty ſuddenly in ſuch caſes) to about 4, 5, or 6 degrees higher, or perhaps more. If a moderate ſtimulus is required, (as may be proper in the chloroſis, and other complaints of the cachectic kind) water from 98 to 106 degrees may be employed; but below the former of theſe it ſeems to poſſeſs little, if any ſtimulating powers. But in all theſe caſes, regard muſt be had to the ſenſibility of the perſon who is to make trial of it; therefore the ſafeſt method is to begin at firſt with the loweſt degree, and proportion the heat afterwards according to the effect thereby produced. I believe it may be ſafely laid down that, if the heat does not exceed 98 or even 100 degrees, no miſchief from it as a ſtimulant can accrue in any caſes in which it is likely to be made trial of; and therefore theſe

degrees of heat ſeem proper to begin with, in caſes where we have any reaſon to fear any ill conſequences from too great ſtimulus.

The point of heat at which its ſedative or antiſpaſmodic qualities are moſt powerful, vary conſiderably as to circumſtances. Thus in the tetanus, in which the antiſpaſmodic qualities of the warm bath * are exerted in a very remarkable and ſimple manner, Dr. Chalmers, whoſe practice in this reſpect is deſervedly commended, uſed water of 96 or 98 degrees when the weather was warm, the pulſe quick, and any preternatural heat on the ſkin. But when the pulſe is ſlow, with little heat, he directs it to be ſo warm as to raiſe the thermometer to 100 or 102 degrees, eſpecially if the weather be cold. This direction may ſerve as a good general guide in many diſorders of the ſpaſmodic kind, eſpecially thoſe which are not conſtantly or neceſſarily attended with fever, as maniacal and epileptic complaints, St. Vitus' dance, the hyſteric and hypochondriac diſeaſe, the convulſive

* Vide Medical Obſervations and Enquiries, vol. I. p. 102.

convulſive aſthma, and hooping cough, menſtrual obſtructions ariſing from ſpaſm, calculous caſes both of the urinary paſſages and of the biliary kind, and ſome caſes of the nervous atrophy.

I do not find any account of the degree of heat that has been found moſt ſucceſsful in the cure of intermittent fevers; but as it is always uſed in the interval of the paroxyſm, I ſhould imagine from 100 to 104 degrees moſt likely to ſucceed, if the patient be ſtrong, and circumſtances favourable, as weather, time of the year, ſituation, &c. and in weak caſes, where ſo great a degree of heat, and the conſequent evacuation by perſpiration, could not be borne, from 96 to 100 degrees may be employed.

In the low delirium of continued fevers, which frequently accompanies the kind called the typhus, a conſiderable degree of heat is neceſſary, as much of the antiſpaſmodic virtue of the warm bath ſeems to depend on its ſtimulus. In this caſe then, from 100 to 104 or 106 degrees would be adviſeable, and by the beſt account is found

to

to be perfectly ſafe, and generally very efficacious.*

In the ſmall-pox, a leſs degree of heat is moſtly preferred, ſince too great a ſtimulus might there be dangerous. By what I can find, the bath is on ſuch occaſions generally heated from 96 to 100 degrees, but ſeldom higher.

The ſame rule, as to the degree of heat, may hold as to its uſe in other exanthematous diſorders, in which this remedy is often employed with advantage.

In fevers, attended with local inflammation, as of the brain, pleura, lungs, bowels,† &c. the heat is generally adviſed to be moderate,‡ yet ſtill ſhould be ſo warm as to obviate any rigor on going into it.

* The fomentations uſed in theſe caſes in the hoſpital at Edinburgh, to ſupply the place of a warm bath, from which the beſt effects are obſerved, are generally heated to 120 degrees and upwards.

† Dr. Heberden mentions that the bath commonly uſed in this diſorder is generally below than above the natural heat of the body. Med. Tranſactions.

‡ Alexander Trallianus cautions againſt the uſe of too warm a bath in ſuch caſes.

it. I ſhould think from 96 to 100 a proper medium.

As to the increaſe of the diaphoretic ſecretion by the warm bath, it appears by Dr. Parr's experiments, that at 96 degrees the inſenſible perſpiration was juſt perceivable, at 98 degrees it was copious, at 100 very much ſo, at 102 the ſweat began to be viſible on the face, at 104 it was very profuſe, and the body was inclined to ſweat during the whole day on uſing the leaſt exerciſe, and at 106 large ſtreams of it flowed down the face, and a moſt copious ſweat over the whole body on going into bed after bathing, which did not appear when any degree of heat under 104 was uſed.

From this account we may draw ſome uſeful inferences relative to the degree of heat, which ſhould be proportioned according to the quantity and nature of the evacuation deſired.

When we wiſh only to reſtore the determination of the fluids to the ſkin, as is frequently the intention in the ſcurvy, increaſed alvine evacuations, the diabetes, and perhaps in ſome maniacal complaints, from

from 96 to 100 degrees should seem most adviseable.*

---

* Dr. Alexander has very ingeniously shewn that this evacuation is confined to certain limits of the heat of the body, above or below which it does not take place. This point he supposes to vary in different persons, and in the same person, at different times; but he generally found it to be about 6, 8, or 10 degrees above what is natural to the constitution in perfect health. But when this heat exceeded 112 or 113 degrees, he never observed any sweat to appear. I do not in the least doubt the truth of this observation; yet I am satisfied that it does not hold of the heat produced by the warm bath, since I have often seen people sweating profusely in baths heated above the points just mentioned. Perhaps it may be alledged, that the heat of the body was not proportionably increased; but I do not see any reason to doubt that, since a thermometer applied to the body rose as high as when in the water. Dr. Parr also found in his experiments, that when the heat of the bath was below 102 degrees, the heat of the body was scarce affected. But from that point upwards, it kept pace with that of the water, in which it was immersed. Yet notwithstanding this great increase of perspiration, there did not appear that languor of spirits, or prostration of strength, as is found to be the consequence of profuse sweating in bed. On the contrary, I have generally found, by their own accounts, that the bathers were more alert and vigorous, and had a better appetite and digestion, on the days they bathed, than at another time. This difference in the effects of the same operation, produced by different means, may be owing to several causes. First, a person who sweats profusely in bed, lies a long time in a bath as it were of his own perspiration, whereby his fibres are relaxed and weakened, and the fluids themselves by the heat soon contract a putrid acrimony, as is manifest by the smell, and are, no doubt, again absorbed, and taint the juices of the body with a disposition of this kind, than which scarce any thing is known which so highly and speedily diminishes the strength. But in a bath the case is different, since there the perspired matter is washed off from the skin as soon as excreted, and all absorption prevented, as well as danger of cold from the linen and bed cloaths, which, if not very frequently changed,

When a large evacuation of this kind is required. as is ſometimes thought neceſſary in the lues venerea, the rheumatiſm,* and by ſome in the gout, the heat may be raiſed to a greater pitch, as from 100 to 110 deg. or even higher; but I * confeſs, if I may truſt my own experience, that I think I have

changed, are apt to grow cold when charged with moiſture. In the next place, the air which a perſon who is ſweating in bed is compelled neceſſarily to breathe, is for the moſt part heated above the uſual temperature, which is apt to induce a faintneſs, or weakneſs, and at the ſame time replete with vapours and animal exhalations, and generally in a ſtagnant ſtate likewiſe. But in the baths where I made the above obſervations, the caſe is very different. The bathers breathe the open air, as the baths have no cover, which, by the difference of temperature of that part which is neareſt the ſurface, from that which is above, is in conſtant agitation, and not loaded with any noxious exhalations. On this ſubject, Dr. Alexander very properly obſerves, that a perſon can bear twice as much ſweating in the open air, as he can ſhut up in a room, or in a bed. This circumſtance muſt, in many caſes, be a great advantage, which the warm bath poſſeſſes in reſpect to promoting this diſcharge, ſince a larger evacuation may be procured by theſe means without ſo much loſs of the patient's ſtrength, and not near ſo much danger of corrupting the fluids of the body, and inducing putrid diſorders.

* Dover's powder, which is commonly given in the rheumatiſm, generally produces an exceſſive diſcharge by the ſkin; but the ſame good effect is obſerved from ſmall doſes of James's powder, or other antimonial medicines, whoſe operation in this way is inconſiderable in proportion to the other.

* It muſt be owned, that leſs hazard attends a ſweat raiſed by means of the warm bath, than other ſudorifics, as Dr. Keill obſerves, that inſenſible perſpiration is not diminiſhed after the ſweat has ceaſed, which was the caſe when that evacuation was procured by other means.

I have obſerved the ſame good effects in the cure of the above diſeaſes from the milder diaphoretics, which have at the ſame time one great advantage, that they do not exhauſt the ſtrength in nearly ſo great degree. I cannot therefore avoid recommending, in ſuch caſes, always to try firſt the inferior degrees of heat before we go higher, ſince the cure by theſe means is much more agreeable, weakens the conſtitution much leſs, and is attended with leſs hazard of getting cold. If the warm bath is uſed as a diuretic, which I believe is not often the caſe, the heat muſt be ſtill leſs than in any of the foregoing intentions. It appears by Dr. Parr's experiment, that this ſecretion was not excited when the heat roſe above 96 degrees. Whenever therefore it is uſed with this intention, it muſt be below this point. To me the proper medium ſhould ſeem to be, that degree wherein a perſon might remain without chillineſs or ſenſation of cold, time enough to give occaſion to a ſufficient abſorption of fluid; and this point, I ſhould conjecture, might be fixed between 86 and 96 degrees, as the caſe and circumſtances required.

This direction is not meant to extend to cafes wherein the warm bath is confequentially diuretic, as in the calculus, where it often acts by its antifpafmodic and relaxing quality, enlarging the diameters of the ducts, fo as to let the obftructing fubftances pafs, but only where it directly affects the fecretion itfelf.

As to the other qualities of the warm bath, as expectorant, fialagogue, and emmenagogue, no certain degree of heat can be fixed, as they are in all probability owing to its fedative and ftimulant qualities, and not produced directly by any peculiar or fpecific action of the warm bath in promoting thofe evacuations.

Time of ftay in the bath.

The proper time of ftay in the bath, is next to be confidered.

This as well as the degree of heat muft be in a great meafure regulated by the intention for which the bath is ufed.

If as a detergent only, which but feldom happens in medicine, no great nicety in point of time is requifite, and will be beft determined by experience. If the quantity of fluid to be abforbed is depended

ed on, a pretty long ſtay in the bath will be neceſſary, which may be eaſier complied with, as the heat which ſeems moſt to favour abſorption is that which is in general moſt agreeable to the ſenſations. I ſhould imagine that from half an hour to an hour, or even longer, might be allowed as a proper time for ſtaying in the bath.

If the rarefying effect of the warm bath on the fluids is expected, a moderate ſtay may ſuffice, as by the beſt computations the circulation is performed twenty-three times and upwards in the ſpace of an hour; therefore, if the patient remains a quarter or one third of an hour in the bath, the whole of the maſs of blood will in the firſt inſtance have paſſed nearly ſix times, and in the ſecond nearly eight times, thro' the veſſels which lie immediately under the ſkin, and nearly in contact with the water, and muſt in conſequence have communicated the warmth thus acquired, to the whole maſs, and thereby rendered the rarefaction equal in all parts of it.

If the warm bath be uſed as a ſtimulus, a ſhort ſtay will, in my opinion, be preferable

able to a long one, ſince I have always obſerved, that when long continued in, it acts as a ſedative, even though the heat be as great as can be borne. On this account, I would always adviſe where this effect is deſired, eſpecially in paralytic complaints, great caution, that the ſtay in the bath be not too long protracted, both on account of the ſedative effects ſucceeding to the ſtimulant,* as is, I believe, conſtantly the caſe, and is directly oppoſite to the intention of cure, and moreover, becauſe the evacuation by perſpiration, which a long continuance in ſuch a degree of heat as is commonly uſed in ſuch caſes is apt to occaſion, is in theſe diſorders highly prejudicial.

In my opinion, from ten minutes to twenty is the time moſt likely to ſucceed in ſuch circumſtances.

When the bath is uſed as a ſedative, it is obvious from what has been ſaid, that a longer ſtay is adviſeable, eſpecially if any

* In Dr. Parr's experiments, the ſtimulant effects of the warm bath were obſerved to be moſt perceptible on firſt going in, and to be ſucceeded by ſedative ones.

any relaxing effect is aimed at, as in the case of contraction of the muscles.

If the complaint be of the system in general, unattended with fever, as in maniacal, epileptic, hypochondriac, and hysteric disorders, &c, no very long stay is requisite, and I should imagine, from 20 minutes to 40 might in general serve the purpose. But in local complaints, where any peculiar obstruction is to be removed, as in calculous and icterical cases, the colic, menstrual obstructions, &c. a much longer time is often necessary, which admits of scarce any other limits than by the effect produced. The like may in some degree be said of its use in fevers and delirium; but we should always at the same time keep in view the intention with which it is used. Thus in some low states of fevers it appears to be antispasmodic by means of its stimulant quality; and this might suggest that the stay should be but short; in others it appears to act by its relaxing quality on the skin, as in the small-pox; and in others, to abate the inflammation by its more purely sedative qualities in lessening the increased

motion of the veſſels, as in inflammations of the bowels, pleuriſy, &c. in which the propriety of a longer ſtay is too obvious to need further remark.

As to the diaphoretic effects of the warm bath, the ſtay muſt be proportioned to the degree of evacuation we mean to promote, and to the heat of the water made uſe of. Thus in the ſcurvy, diarrhœa, and diabetes, where a determination of the fluids to the ſkin, or the reſtoring inſenſible perſpiration only is attempted, a moderate ſtay, as from 15 minutes to 25 or 30 may ſuffice; but where ſweating in large quantity is indicated, as is thought proper by many in the lues venerea and rheumatiſm, a longer ſtay, as from 30 minutes to an hour will be more conducive to anſwer that intention; eſpecially as this evacuation ſeems to be the moſt copious when the ſedative effects of the warm bath are moſt conſpicuous.

On the warm bath as diuretic, I have little to ſay relative to this point. If the ſecretion be ſlow from any defect in the ſenſibility of the urinary organs, the ſame directions ſhould be purſued as when it is

uſed as a ſtimulant. If the paſſages be obſtructed by ſpaſm or calculous concretions, it is to be regarded as a relaxant, and antiſpaſmodic. If we deſire to increaſe this evacuation by means of the quantity of fluid abſorbed by the ſkin, a long ſtay in the bath, as being moſt favourable to abſorption, will be moſt eligible.

As to the other indications, they depend ſo much on thoſe already mentioned, that nothing more in this reſpect need be added concerning them.

Method of uſing the warm bath.

The method of uſing the bath is likewiſe proper to be noticed. If the warm bath be uſed as a ſedative to relieve pain or inflammation, or ſpaſmodic complaints attended therewith, or fever accompanied with great weakneſs or delirium, the operation ſhould be conducted with as little exertion as poſſible* on the ſide of the patient, who ſhould be carried into the bath, and laid down on his back with the

* Hippocrates's directions to the perſon who bathes, are in ſuch caſes very proper:

Oportet autem eum qui lavatur moderatum eſſe & taciturnum, & nihil ipſum operari.

the head a little raiſed, and ſhould continue in that poſture during his ſtay in the bath, and be taken out again in the ſame manner in which he was put into it. When taken out he ſhould be carefully wiped dry with ſoft cloths, but no more friction, than is neceſſary to remove the moiſture, ſhould be uſed. On coming out of the bath, he ſhould be put either between blankets, or ſheets moderately warmed; but great heat either of the bed or room is in all caſes highly improper after this operation, as I have more than once experienced.

If its more active or ſtimulant qualities are to be procured, a different method muſt be followed. The patient ſhould keep himſelf in motion, if he is able, all the time of his ſtay in the bath, and endeavour chiefly to make uſe of thoſe limbs which are the weakeſt, or to extend thoſe which are contracted; both which are frequently more eaſily done than could be expected, both from the ſupport given by the water, and the ſtimulus and relaxing quality ariſing from the heat. On coming out, friction is extremely proper, and ſhould

ſhould be long continued, eſpecially on the part or limb principally affected.

If he goes to bed afterwards, which I am far from thinking always ſo neceſſary as it is generally imagined, the bed ſhould not be made warmer than to avoid rigor, nor ſhould he remain ſo long there as to increaſe the perſpiratory diſcharge, except in a moderate degree.* If the water be very cold, prudence directs againſt expoſure to air, for the remainder of the day; but if that be very warm, and the patient's health will admit of it in other reſpects, I think ſuch a reſtraint not only unneceſſary, but injurious.†

* The cuſtom of putting the patients to bed, and ſweating them profuſely, is mentioned by Oribaſius from Galen, who very juſtly blames the indiſcriminate uſe of ſuch a practice, which has been but too much in vogue in modern times. "Nonnulli ſané medici poſt lavacrum laborantes involvunt, alii in linteis, alii in pannis, ac præſertim incuratis, eoſque undequaque conſtipant ut plurimum ſudent. At certe non opus eſt ſemper, laborantem poſt lavacrum plurimum ſudare. Sæpenumero enim non ut evacuemus corpus ad lavacrum venimus; ſed contra prorſus, ut humectemus irrigemuſque per totum, id quod immoderate erat exſiccatum. Oribaſius, from Galen.

† In Dr. Parr's Experiments, all thoſe who made uſe of the warm bath expoſed themſelves to the air in half an hour's time[k], without receiving the leaſt injury.

[k] Which was then about 68 degrees.

Time of day.

The time of the day at which the warm bath is moſt proper to be uſed, is to be conſidered likewiſe.

Moſt writers* concur in recommending the morning (and before taking food) for this purpoſe, and not without reaſon; ſince, at that time, digeſtion is finiſhed, and the ſtomach empty, circumſtances very neceſſary for the proper trial of this remedy. But, on the other hand, many caſes wherein the warm bath is adviſeable have great need of exerciſe, which can ſcarcely be admitted of in this way of management, except in warm weather, on account of getting cold. For this reaſon, bathing in the evening has been with propriety preferred in ſuch caſes, and has ſeveral advantages, as that it does not prevent taking moderate exerciſe in the open air, either on the day it is uſed, or the ſucceeding one, and likewiſe, being nearer the time of going to reſt, is more likely to act both as a ſedative and diaphoretic.

But

* Commodiſſimum balnei tempus eſt matutinum, poſt ſomnum concoctione peractâ & vacuo ventriculo. Hoffman, de baln. aq. dulc. uſu.

But when it is intended to act as a stimulant, as in paralytic disorders, I think I have observed the morning to succeed best according to the old method of its use, perhaps as coinciding with the efforts of nature, which are then more likely to be exerted than in the evening, after the fatigue of the day. It is obvious that the above is only meant of chronic disorders, since in acute ones, where the patient is confined to his bed, or where any immediate effects are expected from it, as in fevers, delirium, calculous or cholicky cases, and such like, the time of the day is of little consequence.

The time of the year is likewise a circumstance in some cases necessary to be attended to. Time of year.

It has been generally observed at those places where the warm bath is most used, as at the warm mineral waters, that little service is done by them when used as baths in a severe season; and some of the public institutions for the benefit of the poor shew this very plainly to have been the general and antient opinion, since they are confined to the six summer months, and during

ring the remainder of the year no provision is made, on the presumption that no benefit could be then received from the waters. Modern experience confirms this observation, which seems likewise consonant to reason as well as to experience.

When any benefit is expected from the stimulant qualities of the warm bath, as in paralytic cases, the summer months are undoubtedly the most favourable for such a trial, as seconding their effects; and, indeed, it is a common observation, that few medicines of any kind are effectual in this disorder while the weather continues severe. The same may be said, though perhaps not in so great degree, of other disorders in which the indications are of this kind.

Nor is it more effectual, in cold seasons, in giving relief as a diaphoretic, which effect of it is more obviously counteracted by cold than the former. On this account we see rheumatic complaints, gout, scorbutic disorders, diarrhœa, and some cutaneous affections, receive little or no benefit from the use of the warm bath in cold seasons,

ſons, which are almoſt inſtantly relieved on the return of mild weather.*

The ſame rule holds, though the reaſons are not ſo obvious, of its effects as an antiſpaſmodic. We find, by experience, that in the winter months the warm bath is not near ſo ſucceſsful in removing ſpaſmodic contractions of the limbs, obſtinate bowel complaints, and menſtrual obſtructions ariſing from this cauſe, as in the ſummer. I have likewiſe heard, from good authority, that the ſame is true of its uſe in maniacal and epileptic caſes; and have myſelf ſeen an inſtance of it in the nervous atrophy, which ſeems to be a diſorder of the ſpaſmodic kind. I preſume its failure in caſes of this ſort, under ſuch circumſtances, may be in a great meaſure owing to the dependance on, or at leaſt connection of, its antiſpaſmodic, with its ſtimulant and diaphoretic qualities.

But though the fact be undoubted, at leaſt among us, that warm weather is favourable

* Rheumatiſm, gout, ſcurvy, and diarrhœa, from obſtructed perſpiration, are rarely ſeen in hot climates in compariſon with us.

vourable to the good effects of the warm bath, yet great extremes of this kind have not been found most proper for a trial of it.* The reason of this in general appears to be, that in very hot weather, the use of the

* It may seem an objection to this position, that the Russians, and other nations still more northerly, as it is said, use the warm bath with great success as a remedy in almost all their disorders, and that in the very coldest weather. Nay, that they make the most sudden transitions, from the most excessive heat the body can endure, to the most extreme cold; and this without any ill effects being commonly observed from it, and often with great relief in their disorders. 'Tis even said that the rheumatism, which we might from our own observation think likely to be brought on by such management, is unknown in Muscovy. To what such a difference is owing, is difficult to explain; but we may observe, that the warm bath used in this way, is not only used medicinally, but is a common and frequent practice among the Russians, especially of the lower ranks; so that probably its effects are not similar to what such a practice might induce upon us who are unaccustomed to it. Besides, their baths are hotter, and always with a mixture of the vapour kind, which is very powerful in promoting perspiration. I imagine it is in order to take off the languor, faintness, and muscular relaxation, which so great a degree of heat induces, that they expose themselves afterwards to the cold, which being likewise in form of a cold bath, as they roll among the snow, and their stay in it but of short continuance, it is probable does not check the insensible perspiration afterwards more than a cold bath among us, which is not found to have that effect, and has even been used, as is said, with success in the rheumatism itself.

The mode of using the hot bath and cold alternately, was not unknown to Celsus, who, in the hydrophobia, directs, Ut protinus a piscinâ in aquam calidam demittatur æger.

It is observable, that he inverts the order in which it is used in Russia.

the warm bath is apt to increase the perspiratory discharge to an immoderate degree, which diminishes the strength considerably, which is contrary to the intention of cure, when used either as an antispasmodic or stimulant. Besides, in very irritable habits, the incautious use of the warm bath in hot weather, especially if heated to a great degree, has been productive of fevers and other inflammatory disorders.

Regimen proper to be obferv'd during the use of the Warm Bath.

As to the regimen and mode of life proper to be observed during the use of the warm bath, I know of none that is peculiarly applicable. In general, great moderation in the use of fermented liquors is proper, and of high dressed food; though sometimes, where the stimulus of the warm bath is indicated, as in paralytic cases, a greater latitude in these articles may be allowed. Moderate exercise, in most cases not attended with fever, is proper; and if the weather be warm, may be used on the day of bathing, after that is over, if it be in the morning, without danger of getting cold, as I have often experienced.

A moderately lax state of the intestinal canal has been likewise by all practitioners deemed

deemed proper to be preſerved during the uſe of the warm bath. If this can be done by natural means, ſuch as any proper variation of the mode of life or quality of food, it is moſt eligible; but if theſe are inſufficient, recourſe muſt be had to medicine.

The foregoing directions, as to the uſe of the warm bath, are to be underſtood in a general ſenſe, and to admit of great variation from circumſtances, ſuch as age, habit, ſtrength, &c. They are likewiſe almoſt altogether calculated for chronical diſorders, and not to be ſuppoſed applicable when any immediate or ſudden effect is expected from the warm bath, as in fevers, and other acute caſes, for which no directions, except ſuch as are ſuggeſted by the exigency of the caſe itſelf, can be laid down.

The DEGREE *of* IMMERSION.

Degree of immerſion.

The next circumſtance to be conſidered, as varying the effects of the warm bath, is, the Degree of Immerſion; or whether the water be applied to the whole of the body,

body, or to part of it only, as in the way of topical baths.

I have already treated of the effect of a warm bath applied to the whole body; therefore, the present chapter must be confined to topical baths only, or rather to the difference of effect between them and general baths.

Topical baths, then, differ from universal; 1st, in the degree of the effect produced.

That a quantity of hot water applied to the whole body, in form of a bath, must be a more powerful application than the same substance applied to a particular part only, seems to need little proof.

As a detergent, it is obvious those parts only can be affected with which it comes into contact. As absorbed, it may indeed affect the whole system, but in a less degree, as the surface which it covers is diminished, and the quantity absorbed, so in proportion.

The like is true of its rarefying effects in a still greater degree, as the blood is cooled

cooled by paſſing through veſſels contiguous to thoſe parts which are not covered by the water.

As the ſurface to which it is applied is leſs, ſo muſt the ſtimulus of the warm bath, which is chiefly owing to the nerves of the ſkin; and the ſame is true, for a ſimilar reaſon, of its ſedative or antiſpaſmodic quality, which depends in a great meaſure on the two laſt mentioned.

As the other qualities of the warm bath ſeem to be owing to the above, or rather modifications of them, 'tis needleſs to deſcant on each, ſince it is plain they muſt be in proportion to the primary quality from which they are derived.

2dly, Topical baths vary from univerſal in reſpect of their affecting the body unequally as well as in a leſs degree.

On this account is founded in part the doctrine of revulſion, which has, of late years eſpecially, been a matter of great diſpute among the learned.

To enter into this controverſy at large, would take up too much room in a work of this kind, and is leſs neceſſary, as it has

has already been handled by ſeveral able writers: I ſhall therefore give only a ſketch of the principal arguments uſed by each party, and ſubjoin a few obſervations of my own.

The advocates for this doctrine reaſon thus:*——

When the feet, or any other part of the body, are immerſed in warm water, the veſſels of that part are relaxed, or become more readily diſtenſible, by which, as they yield eaſier to the impetus of the blood, their capacity is increaſed, and of conſequence a larger proportion of blood is accumulated in them, and its bulk in reſpect to the other parts proportionably diminiſhed. In ſupport of this it is alledged, that the veins of the parts covered with water become turgid and hard to the touch, that the head-ach and delirium accompanying fevers, which are imputed to a fullneſs

---

* Pediluvia humiditate ſua temperate calida fibrarum tonum in partibus inferioribus valde relaxant carnemque & cutim emolliunt, unde ſanguis relicta ſuperioris corporis regione ad ampliatas inferiores partes majori impetu ruit.— Hoffman, de remediis ad ſanitatem tuendam, &c. §. xviii.

Vide alſo Boerhaave, aphor. 396.—and Van Swieten's Commentary.

a fullneſs or plethora of the cephalic veſſels, are relieved by the pediluvium, and the bulk of the parts that are immerſed in the water is increaſed.

On the other hand it is replied, that if this were the method by which the pediluvium, or other topical baths, act, the veſſels in the other parts of the body, which are not in contact with the water, ſhould appear diminiſhed in ſize as the quantity of blood which they contain is decreaſed; but on the contrary, that the veſſels of the whole body, the head eſpecially, ſoon grow turgid when the lower parts only are in the bath; and this happens in much greater degree as the heat of the water is increaſed, which is contrary to the foregoing theory, as they ought in ſuch caſes to be leſſened as the relaxing power of the bath is increaſed, as is certainly true of it as the heat is augmented. The pulſation of the arteries in the head is much ſtronger, and a ſenſation of fullneſs and diſtention perceived in it, even though the water never roſe higher than the knees. Beſides, if the relief procured by the warm bath was gained by theſe means, the drawing a quantity

a quantity of blood proportionable to the increaſed capacity of the veſſels would have the ſame effect, and be more durable; but we know by experience, that moſt of the head-achs which find ſervice from the pediluvium, are ſuch as are not accompanied with fever or inflammation, but of the low nervous kind, and in ſuch as ſtimulant and antiſpaſmodic remedies are proper, and where letting blood is found injurious: That in inflammatory caſes, eſpecially where the brain is affected, the pediluvium is highly dangerous, and has often evidently induced a delirium inſtead of relieving it, and increaſed the pain of the head in ſimilar circumſtances: That the increaſe of the bulk of the veſſels is owing to the rarefaction of the blood by heat, which is evident from the increaſe of them in parts of the body to which the water does not reach: That the ſame effect of it on the fluids renders it ſerviceable in head-achs, and other low nervous caſes, which often ariſe from inanition. To theſe might be added, that many of its antiſpaſmodic qualities, eſpecially where the ſenſes are affected, depend probably very much on the pleaſing ſenſation it induces, which

is of much more consequence in such disorders than could be supposed to arise from a partial derivation of a small portion of the circulating fluids.

The pediluvium has likewise been used on a principle similar to the foregoing in the small-pox. It has been long observed of this disorder, that the degree of danger was to be estimated in a great measure from the number of pustules on the superior parts of the body, the head especially. If these were few in number,* the event was generally fortunate, and if very numerous, more danger was to be apprehended. With intent therefore to increase the number on the lower parts of the body, and thereby to draw down or derive the matter from those parts which are of more importance,

---

* Inculcabat semper auditoribus suis celeberrimus Boerhaavius ut inferiores corporis partes perpetuo foverent & laxarent ubi hujus morbi suspicio adesset, sive balneo, sive pannis laneis, emolliente decocto calido madidis, perpetuo applicatis, simul autem hoc fiebat, ideo quia sperabat maximam copiam materiæ morbosæ sic versus inferiora corporis derivare posse, & a superioribus partibus averti. Van Swiet. Comm. vol. v. p. 75.

Dr. Huxham also used the pediluvium with intent to derive more powerfully the blood and variolous matter contained in it to the lower extremities. Vide his Treatise on the Small-pox.

importance, the pediluvium was introduced into practice, and seemed to answer the intention very successfully, generally procuring an alleviation of the symptoms, and an increase of the number of the pustules on the legs * and feet. But though the use of the pediluvium in the small-pox be justly recommended, I am inclined to suspect that its mode of action has been mistaken. It is far from being clear to me, that the increase of the pustules in one part of the body (which may at any time be done by keeping it particularly warm, especially if it be covered with flannel) decreases their number in another part, or that the increase of the eruption beyond the number that seem to come out spontaneously, is ever of service. In the inoculated small-pox, it is easy to increase the number by bringing the patient near a fire, or into a warm room; but this increase is always attended with symptoms which it is our intention to avoid as much as possible, and which vanish immediately on the retrocession of the

* It is certain, that where this method is used, a vast many pocks break out on the legs and feet.

Huxham on the Small-pox.

the eruption when the patient is removed into a cool place, or the open air. Nor does it appear that any increaſe of this kind leſſens the number in the other parts, but more probably rather augments it, by adding to the irritation and fever, which is in a great meaſure in proportion to the eruption. Beſides, the ſame good effects have been obſerved from bathing the whole body, in which caſe no ſuch partial derivation could take place. I own I ſhould have much greater expectation from the ſedative qualities of the warm bath, in allaying pain and irritation, and procuring ſleep, which it does in the beſt manner, and without the ill effect of opiates, than from any partial determination it occaſions. I will not deny, that by ſoftening the cuticle it may cauſe the eruption to be attended with leſs pain and trouble, and perhaps, as is ſaid to be the caſe in ſome in whom this membrane * is more denſe and hard than natural, which retarded the eruption beyond the due ſeaſon, forward it properly in the manner intended by nature.

I have

* Vide Huxham, p. 138.

Some ingenious writers have attributed the peculiar mortality of the ſmall-pox in cold countries to this cauſe.

I have heard it remarked by an ingenious practitioner, that though the pediluvium ſeldom failed of increaſing the number of the puſtules in thoſe parts to which the water is applied, yet he never obſerved this effect when a bath to the whole body was uſed, although it ſeemed a more powerful remedy in allaying the ſymptoms. This I am confident is owing to the greater heat which is generally given to the pediluvium, than to the bath wherein the whole body is immerſed. The former of theſe I have often obſerved to be of 112 or 116 degrees of heat, whereas the warm bath in feveriſh caſes is ſcarce ever above 96, and much more care and attention is generally paid to the heat of this laſt than to the pediluvium. The feet are, indeed, able to bear a greater degree of heat than the trunk of the body, as the cuticle that covers them is conſiderably thicker, and more denſe and hard. What confirms this opinion is, that I have obſerved when proper care has been taken not to raiſe the water of the pediluvium above the degree of animal heat, no increaſe of eruption on thoſe parts followed, notwithſtanding the ſame good effects were the conſequence of uſing it.

On the whole then I think there is great reafon to imagine that this theory, concerning the advantage to be gained by any topical application of this kind, is not founded in truth, and that no effect can be produced by a partial bath which a general one would not promote more powerfully, provided the circumftances, as heat, &c. were equal. I do not, however, mean to deny, that there is no choice with refpect to the parts to which topical applications, even in general affections of the fyftem, may be made. The feet are moft generally bathed as moft convenient, but we have no good experiments yet made with refpect to the difference of effect in bathing them, or other parts of the body.

But although I think it highly probable that topical baths differ from general ones only in degree of effect, yet I allow that many circumftances occur wherein a topical application is preferable to a bath of the whole body.

In the firft place, it is fooner and more eafily procurable. Few fituations, except where natural warm fprings arife, or in capital cities, admit of the conveniencies neceffary

neceſſary for a warm bath to be always in readineſs,* and therefore much time muſt be often loſt in caſes which demand the moſt immediate relief, in waiting 'till ſuch could be procured, and a ſufficient quantity of water heated for the occaſion. But a pediluvium, or partial fomentation, may be always had, as it requires little time or preparation, and is procurable by all ranks of people.

Another convenience is, that ſuch applications may be made with much leſs trouble and fatigue to the patient. A fomentation may in general be employed with little change of poſture, or need of raiſing the patient upright, which in ſome acute caſes, eſpecially fevers,† is a matter of great importance, and the latter of theſe may be ſaid of the pediluvium likewiſe. Another

* Hippocrates complains of this, in whoſe country the warm bath was much more in uſe than among us.

Quandoque vero minus eo (balneo) utendum eſt, propterea quod homines ad hoc ſunt imparati. In paucis enim domibus præparata ſunt neceſſaria inſtrumenta, & nec miniſtri, velut opus eſt, parati habentur. Hippocrates, de victu acutorum.

† Vide Hoffman, de ſitu erecto in morbis periculoſis valdè noxio.

Another advantage of topical baths, eſpecially fomentations, is, that they may be applied hotter than an univerſal bath; and thus in local complaints their diſcutient and antiſpaſmodic effect upon any particular part may be increaſed. The heat of the fomentations in hoſpitals are generally 120 degrees, and often more, which is a degree that would be almoſt intolerable if applied to the whole of the body, but is eaſily borne when only a part of it is ſubjected to the operation.

Another circumſtance in favour of baths of this kind, is, that they may be uſed in ſome caſes wherein the others are improper. Thus an ulcer, or open wound, renders the warm bath unadviſeable, as it can ſcarcely be prevented from coming into contact with it, the bad conſequences of which have been before taken notice of; but this by no means contradicts the uſe of a fomentation, or partial bath, provided it does not touch the ulcerated part.

Such is my general opinion relative to topical baths. I have not attempted to decide on the particular caſes or diſorders in which they are peculiarly indicated, both

on

on account of the bulk of the work not admitting it, and as I have before declared my opinion that they differ from an universal bath only in the degree of effect they produce; and that all their qualities may be explained by, and referred to, what has been already said in the first chapter.

The partial baths most commonly in use are a semicupium, or half bath, wherein the water rises as high as the waist, and a pediluvium, wherein the feet and legs only are immersed. A bath for the head only is met with in authors, and sometimes advised in the present practice, called a capitiluvium,* and a bath for the hands and arms, which has no peculiar name that I know of belonging to it. If any topical application to the other parts of the body be required, it is generally done in the way of fomentation, except when the water is thrown with some degree of force on the part, as when the stillicidium, or pumping, is employed, which is the subject of the following chapter.

* This partakes in some measure of the nature of a stillicidium, as that is the only method by which water can be applied to the head only, except in the way of fomentation.

MODE *of* APPLICATION.

The effects of warm baths likewise vary according to the mode of application, as whether the water be applied in the way of quiet immersion, or whether it be thrown with a degree of force on the part, as in the stillicidium or pumping.

The last of these differs from the former principally in that its stimulus is greater. I find, by experience, that the heat of the water is more sensibly felt when it is thrown with a smart stream on the part, than when the latter is quietly immersed; and that it is hotter on being taken out, retains its heat longer, and appears more red and swelled.

This may be owing to several causes. First, the heat of the fluid applied to the skin is really greater than if the part of the body had remained without motion in any warm bath, above the animal heat, and of the same temperature, since the particles of the water as they come into contact with the body must be cooled by it, and thus form a kind of watery atmosphere surrounding it of an inferior heat to that farther

ther removed. But in a ſtillicidium, this cannot take place, ſince the particles of water are there applied to the ſurface in quick ſucceſſion, and do not remain long enough on the part to have their temperature altered ſenſibly.

Next, the ſtimulus is greater, from the force wherewith it is applied, whereby the ſubcutaneous veſſels and glands are compreſſed, the circulation in the part rendered quicker, the contents of the glands emulged, and the abſorption, as I ſhould imagine, increaſed likewiſe. The hand is found to abſorb a much larger quantity when well rubbed, before it be put into water, than without ſuch preparation. Now the effect of pumping ſeems ſimilar to that of friction, both in a mechanic view, and from its obvious effects in irritating the part to which it is applied.

On account of its ſuperior ſtimulus the ſtillicidium is preferable to a warm bath in many local diſorders, where a ſtrong effect of this kind is deſired.

Thus in partial palſies, it is frequently of great ſervice applied to the part affected,

fected,* and ſometimes to the place from whence the nerves that ſupply that part derive their origin, as in ſome affections of the lower extremities.

It is alſo preferable on the ſame account in diſcuſſing glandular ſwellings, gouty concretions, and other ſtubborn indolent tumours, which often yield to it after other means had failed.

It is almoſt unneceſſary to obſerve, that nearly the ſame cautions are proper with reſpect to topical baths and pumping as to univerſal baths, though in leſs degree.

Form in which the fluid is applied.

I now come to the laſt chapter on warm bathing in general, which reſpects the form in which the bath is applied, as whether the

---

* Ubi autem medicatæ thermæ cum impetu proſilientes, vel ex alto decidentes, in partem paralyticam movent, & concutiunt ſatis fortiter, tunc ſæpe pulchré profuerunt; tales caſus recenſuit celeberrimus Cocchi. Verum Cælius Aurelianus in cura paralyſis dicit aquarum ruinis partes in paſſione conſtitutæ, ſunt ſubjiciendæ, quas Græci καταχλυσμυς appellant, plurimam etenim earum percuſſiones faciunt corporum mutationem. Ubi pulchrè præcipuum effectum aquæ illabentis percuſſioni adſcribit. Van Swiet. Comm. §. 1069.

the fluid be in its natural form, or as converted into vapour, called a vapour bath.

On this head it will be proper to ſay a few words on the ſubject of vapour in general.

All bodies with which we are acquainted have, by the application of a certain degree of heat, their component parts diſunited, and reduced into a ſtate of repulſion from one another, or at leaſt of receding from each other. This was formerly thought to be the caſe only with fluids, and ſome particular ſolid bodies; but latter experiments prove that all bodies, even gold itſelf, are capable of being reduced into this ſtate.

The degree of heat neceſſary to reduce bodies into this ſtate varies according to the nature of the ſubject. It does not always follow the ratio of their ſpecific gravity either in ſolids or fluids: Gold, indeed, which is the moſt ponderous of any ſubſtance, is with moſt difficulty brought into this ſtate; but lead, though conſiderably heavier than either copper or tin, is diſſipated in vapour by a much leſs heat.

heat. The ſame is true of fluids, which is more applicable to the preſent purpoſe. The nitrous æther, which is the lighteſt fluid known, is diſſipated in the common temperature of the air; but expreſſed oils, which are of leſs ſpecific gravity than water, require, nevertheleſs, a greater degree of heat to raiſe them in vapour. Whether the degree of heat neceſſary for this purpoſe be in any compound ratio of their ſpecific gravity and tenacity, I cannot determine, but rather think it generally depends more on ſome ſpecific qualities of the bodies not reducible to theſe heads. But this ſubject is too copious to be conſidered here with reſpect to bodies in general; I ſhall therefore confine myſelf to water only.

At what degree of heat the vapour begins to be viſible from the ſurface of water, I cannot aſcertain, and perhaps the point is not fixed, but varies as the boiling point does, according to the weight of the atmoſphere. I have obſerved it in a ſlight manner, about 73 degrees, below which it is, I believe, ſeldom viſible. This gradually increaſes 'till it comes to 212 degrees, which is generally held at a medium

medium to be the boiling point; but at this degree the quantity of vapour difcharged is prodigiouſly increaſed, being near twenty times the quantity to what was exhaled a few degrees below that point. Here it was formerly thought to ſtop; and that as the heat of the water in an open veſſel could not be increaſed, ſo the evaporation could not likewiſe. But this is found to be an erroneous opinion, ſince by making it boil violently, the quantity evaporated may be ſtill greatly augmented. At what point of heat the ſteam begins to be condenſed is not determined, and indeed varies as the vapour is more or leſs concentrated. When diffuſed through a large ſpace it requires a greater degree of cold to condenſe it than if it was compreſſed into a ſmaller compaſs. As to the mode by which heat acts in raiſing water in vapour, it is difficult to form any conjecture.

Since it has been diſcovered that air acts as a menſtruum to water, and as the power of menſtrua in general, and of air particularly, in diſſolving bodies, is much increaſed by heat, we might be led to imagine

gine that ſomething analogous happened in this caſe, and that the water by heating the air contiguous to its ſurface enabled it to diſſolve a greater quantity; and that, as the air thus loaded with water became expanded by heat, and agitated by the motion on the ſurface of the fluids, it came into contact with air of a leſs degree of heat, which cooled it, and cauſed it to ſeparate part of the fluid it had diſſolved, which being in a diffuſed ſtate, appeared like clouds, which form vapour aſſumes before the particles of water have, by attracting one another, formed drops ſufficiently largeto precipitate themſelves downwards by their own gravity. But this opinion, tho' apparently plauſible, is liable to ſeveral objections. That a conſiderably greater quantity of water is thus diſſolved in theſurrounding air, I have no doubt; but I am well ſatisfied that this alone is not ſufficient to ſolve all the phænomena relative to vapour. Water when converted into this ſtate is extremely elaſtic, ſo as to burſt the ſtrongeſt veſſels, and lift the greateſt weights; and on this principle it is uſed in the fire engine for drawing water from mines. But air loaded with water, either

in

in a diffuſed or diſſolved ſtate, has its elaſticity diminiſhed, and ſeems never ſo elaſtic as when it is in a ſtate of abſorbing water. Thus we find the barometer higher in the ſpring and ſummer, when by the winter's rains moſt of the moiſture has been diſcharged from the air, and when the evaporation is the quickeſt; and the ſame is true of clear froſty weather, in which moiſture is found to be abſorbed very rapidly by the air. Beſides, water diſſolved in air, like other ſolutions, does not injure its tranſparency; but vapour is always turbid, even in its moſt elaſtic ſtate. I ſuſpect, too, that the vapour of water is not miſcible with the air of the atmoſphere. In the fire engine, mentioned above, when the jet of cold water has been let in, a vacuum is formed in the place before occupied by the air; and this is ſo complete, that a proceſs of the ſame kind has been propoſed as an improvement of the air pump, as procuring a more perfect vacuum than could be gained by any other means. Beſides, the effect of heat in increaſing the power of menſtrua, ſeems to go on in a pretty regular proportion with the degree of it applied; but in this caſe,

the evaporation is ſurpriſingly augmented in paſſing from the degree next below the boiling point to that at which it commences. To me, the repulſive quality with which the particles of water are endued towards one another in a certain degree of heat, and their attraction towards each other, or diſpoſition to unite when the heat is diminiſhed below a certain point, ſeem more ſimilar to an electrical quality * than any that I can ſuggeſt. But I mention this only as matter of the moſt diſtant conjecture.

The effects of a vapour bath upon the human body have been in general repreſented as ſimilar to thoſe of warm water. But in ſome inſtances they are thought to poſſeſs the ſame powers in a higher degree.

Thus vapour has been thought to poſſeſs greater † relaxing and diſſolving powers,

* Electricity is found to have a very remarkable and ſudden effect in condenſing vapour. I have been informed that if an electrified wire be brought into contact with the ſteam iſſuing from the ſpout of a tea-kettle, that it will be inſtantly precipitated in drops. To this quality is probably owing thoſe great and ſudden ſhowers which generally accompany thunder.

† Longè potentius laxat & reſolvit omnia tepidus aquæ vapor quam aqua calida. Docent hoc duriſſima cervorum

cornu

and of conſequence to be more efficacious in rigidities of the limbs, and obſtructions of all kinds, than water in its uſual form. To prove this it is ſaid, that the hardeſt horns of deer are ſoftened by means of ſteam, which could not be done by boiling them the ſame time in water. But I ſuſpect the caſe is not here fairly ſtated, as to a compariſon of the effects of water in the above-mentioned ſtates. When hartſhorn is intended to be ſoftened by theſe means, it is ſhut up in a cloſe veſſel, and the ſteam, and water from whence it proceeds, have no communication with the open air, by which the heat is raiſed many degrees above the boiling point, and acts in the ſame way with Papin's digeſter, which it is well known will, by the heat of the wâter alone, reduce the hardeſt bones into a pulp or jelly in a ſhort time.

If the effects of water and vapour were compared on an equal footing, the event would have been found very different. I

 allow

cornua quæ ſpagyrica dicta in officinis præparatione molleſcunt ſatis citó dum aquæ ebullientis vapori exponuntur, quod diuturna etiam coctione fieri non tam bene poſſet. Van Swiet. Comm. §. 606.

allow a confined ſteam may have greater diſſolving powers than water boiled in an open veſſel, as it may, and will be of a greater degree of heat; but am certain that animal ſubſtances are ſooner ſoftened and diſſolved by being put into a veſſel of boiling water, and kept boiling, than by being ſuſpended over the ſteam of it.

Of late years it has been cuſtomary to dreſs both fleſh, meat, and vegetables, in this way, eſpecially ſuch as we deſire to preſerve the form moſt entire, as chicken, &c. and the more tender vegetables. But it has been always found that it took much longer time to bring them to the ſame degree of tenderneſs than if they had been put into the water itſelf. I made the experiment myſelf with one of theſe ſteam pots, which are very well contrived for the purpoſe of ſuch a trial. I took two pieces of the ſame meat, of equal ſizes, one of which I put into the water, and the other into the veſſel above it, into which the ſteam riſes. After the water had boiled twenty minutes, I took the veſſel from the fire, and examined the pieces of meat: that in the water was conſiderably ſofter, and more pulpy, and of a whiter colour than

than the other, which had been expoſed to the ſteam only. I have repeated this experiment ſeveral times, with various kinds of meat and vegetables, and always found the event ſimilar to that juſt mentioned. But granting the diſſolvent powers of vapour to be as great as is repreſented, it is certain that it never could act under that form upon any obſtructions generated in the human body, ſince it muſt be condenſed into water before it could penetrate ſo deeply. The body is not capable of ſuſtaining more than 120 degrees of heat, which is greatly below that point which is neceſſary to keep water in the form of an elaſtic vapour. I therefore look upon all reaſoning of this kind, drawn from the effects of vapour on other ſubſtances, granting them to be as conſiderable as is repreſented, to be frivolous and unſatisfactory, becauſe it cannot be applied to the ſurface of the human body, much leſs penetrate to the interior parts, in that ſtate which its diſſolvent effects are moſt obſervable. The ſteam of water has been by ſome writers repreſented as more penetrating than the water from which it ariſes. To prove

 this

this the following experiment has been adduced:

" Put a little ſalt of tartar into a glaſs
" pan, and tye a piece of dry bladder over
" its mouth: Now boiling water may be,
" for a long time, poured on this bladder
" without getting thro' its pores, whereas
" the ſteams of ſuch water gain an imme-
" diate admiſſion, which they demon-
" ſtrate by diſſolving the ſalt almoſt as
" ſoon as they are applied.

I have tried this experiment myſelf repeatedly with the ſteam of boiling water much hotter than could be ſuſtained by the human body, but always found that a bladder, when carefully tied in the manner before mentioned, was impervious to moiſture, both from vapour, and when immediately applied in contact with boiling water itſelf. If kept long in boiling water, its texture was ſo diſſolved that it came in time to admit moiſture through its pores; and poſſibly this might be the caſe with ſteam, if long continued; but I can ſay, from experience, that a bladder will reſiſt ſteam much longer than it will the immediate contact of boiling water.

As

As to its ſtimulus, vapour ſeems to the ſenſes leſs ſtimulant than the immediate contact of warm water; and by what I can obſerve, from experience, is ſo in reality, as the pulſe was not quickened by it ſo much as by water of the ſame degree of heat. It is obvious that it muſt on this account be leſs ſerviceable than a bath in the common way, in caſes where the ſtimulus of the warm bath is of ſervice, as paralytic caſes, &c. but on the other hand it may perhaps be thought preferable in ſome caſes of great irritability, as in maniacal caſes, or delirium accompanied with inflammation of the brain or its membranes. But in the general caſes of fevers, which are found to have received the greateſt benefit from warm bathing, I doubt if the common mode of uſing the warm bath be not preferable to vapour. Moſt of thoſe which Dr. Gilchriſt has related, ſeem to have been of the low nervous kind, wherein a gentle ſtimulus was evidently indicated, and of conſequence this quality of the warm bath probably contributed greatly to its good effects in removing the diſorder.

As to the comparative effects of the warm bath, in its usual form, and in form of vapour, as antispasmodic remedies, I cannot well determine: Perhaps, as in the last instance, vapour might be more eligible in some cases accompanied with great irritability; but I am satisfied that in many cases the usual form of a warm bath would be far preferable, as I am clear much of its antispasmodic virtue depends on the peculiar and pleasing sensation induced by the water (in a body) coming into contact with the skin. This is exemplified in a remarkable instance related by Dr. Whytt,* where a spasmodic cough was restrained by immersing the feet in warm water, when neither heat and moisture, either separately or combined, or warm steams, or vapour, had any such effect.

I have

* It remains, therefore, that warm water, by its particular action on the extremities of the nerves to which it is applied, renders the whole system less sensible of any irritation. Whytt's works, p. 610.

It appears, from the above experiments, that warm water affects our nerves very differently, not only from a dry heat, but also from warm steams, or cloths dipt in hot water; a fact which seems not to have been known, or at least not sufficiently attended to, and which perhaps may afford some useful hints in practice. Whytt's works, p. 610.

I have likewise myself seen cases, both of biliary calculi, and those of the urinary passages, where fomentations have been ineffectually tried, (even though they were impregnated with narcotic ingredients) wherein the pain has * instantly ceased on entering the warm bath. I never had an opportunity of making the experiment comparatively in internal inflammations, as of the bowels, lungs, &c. but from analogy we may with great probability conclude, that the event would be similar. Dr. Porter has observed very properly, on the bilious colic, "that attempting the cure by "fomentation is an insufficient, defective, "and partial method, in comparison with "immersion in a warm bath, which is an "universal fotus to the lower trunk of the "body, whose application to the part is "the same, its warmth much more equal, "and the extent of its relaxing influence "perfect and general on all the abdominal "region."†

But

* The sudden ease procured by the warm bath in such cases, proves that it is owing to the sensation it occasions, as it is too quickly procured to be supposed to be owing to any other qualities.

† Edinb. Medical Essays, vol. III.

But even ſuppoſing the vapour applied to the whole body; we have no reaſon to think it would prove equally antiſpaſmodic with a warm bath in the uſual form, ſince the ſenſations they induce are by no means ſimilar; and when compared, (as in the caſe related by Dr. Whytt, which ſeems to be a fair trial, as no more of the body was expoſed to the action of the water than was to the ſteam) the effects of the warm water were by far more powerful.

With regard to their diaphoretic qualities, it is difficult to make any compariſon. When the body is immerſed in water, the matter perſpired is waſhed off, and mingled with the water as it iſſues out; and when a vapour bath is uſed, a conſiderable quantity of ſteam is always condenſed on the ſurface of the body, which makes the perſpiration to ſeem greater than it really is. But the quantity diſcharged in both caſes is probably very large, when the heat either of the vapour or of the water is raiſed to 104 degrees, or above. In Dr. Parr's experiments we find, that at 104 and 106 degrees of heat of the bath, the ſweat flowed in large ſtreams from the face,

and we may ſuppoſe the diſcharge was not much inferior in thoſe parts of the body which were covered by the water. The vaſt diſcharges of the ſame kind procured by ſteam, and the evacuation of the water in dropſical complaints by the like means, are great evidences of this. Whether the diſcharge in the laſt inſtance may be greater than in the former, on account of the leſs reſiſtance it meets with in being thrown outwards,* I cannot determine; but if we may judge from circumſtances of a ſimilar kind, as the evacuation of urine in a bath, or the flow of blood from a vein, as in bleeding in the foot, the projectile force outwards ſeems but little diminiſhed by the preſſure of the ſurrounding water, and conſequently in all probability the perſpiration but little affected.

As to the other effects of the warm bath as diuretic, expectorant, ſialagogue, and emmenagogue, they depend ſo much on thoſe already mentioned, that the comparative

---

* Van Swieten prefers vapour baths on this accoun[illegible] the removal of obſtructions. Partes enim corporis a[illegible] merſæ comprimuntur, vapor autem omnia la[illegible] Swiet. Comm. §. 127.

rative efficacy of ſteam and water in theſe reſpects may eaſily be inferred from what has been already ſaid.*

But though I am much inclined to believe that vapour baths are inferior in efficacy, as to their general qualities, to a bath in the uſual form, yet ſeveral circumſtances may occur which render a vapour bath more eligible: Firſt, then, it may be applied without taking the patient out of bed, or ſo much as altering his poſture; a thing of great conſequence in many weak caſes, eſpecially of the febrile kind, wherein the raiſing the patient to an erect poſture has frequently induced the moſt alarming ſymptoms, and even death itſelf. This inconvenience is entirely obviated by ſome late improvements made on the machines uſed for that purpoſe, whereby the ſteam is conveyed gradually between the bed cloaths to all parts of the body, without the leaſt neceſſity for any effort or exertion on the part of the

---

* I ſhall ſpeak more of the compariſon of medicated baths [illegible] ual form, and medicated vapour, when I come to [illegible] ſubſtances that may enter into the compoſition [illegible] th. What has been ſaid here relates only to [illegible] vapour.

the patient. Another convenience of vapour, is, that it may be more gradually applied, both with respect to quantity and the degree of heat. By increasing or lessening the diameter of the tube through which it passes, which is easily done by means of a stop cock, the steam is entirely under our command in both these respects, and may be more easily removed altogether than a bath in the usual form. Fomentations indeed possess several of the abovementioned advantages, but then their effect is but partial; whereas the vapour bath has the advantage of being either general to the whole body, or applied to any particular part only, as occasion may require. Vapour has likewise this great advantage over all fomentations, that the heat communicated by it is more equable, and may be easier kept to any certain pitch for any length of time, whereas fomentations are liable to great uncertainty in this point, being generally too hot when first applied, and often before they are removed grown so cold as to counteract in some measure their former effect. Besides, the frequent opening the bed cloaths, which is necessary (when fomentations are employed)

ployed) in order to change them, is apt to let in a ſtream of cold air on the part which had been juſt before expoſed to a great degree of heat, and moreover fatigues the patient, from both of which inconveniencies vapour is totally free. Vapour is likewiſe much leſs liable to wet the bed cloaths than moiſt fomentations; a circumſtance of no ſmall conſequence in caſes of great debility, where no change of theſe can be had from the danger of moving the patient.

Another great advantage of vapour above every other form of a bath, is, that it may be applied to parts of the body which a bath in the uſual form either could not reach, or be conveniently applied to them. Thus vapour may be eaſily conveyed to the lungs, if judged neceſſary, by inhaling it with the breath, which a fluid in any other form could by no means reach, and indeed this is the only method by which any application whatever can be made immediately to thoſe organs. This is a matter of great conſequence to be attended to in diſorders of thoſe parts, which frequently require a ſpeedy and efficacious remedy, both of which qualities are frequently

quently found in vapour, in cafes of inflammation and obftruction.

The fame may be faid of the advantages of vapour in inflammations of the trachea and larynx.

Vapour likewife furnifhes a commodious application to feveral other parts of the body, which a fluid in its ufual form, tho' capable of being applied, could not fo conveniently reach, or remain in contact with, efpecially if they were in a tender or inflamed ftate. This is the cafe with inflammations of the eye, of the inner parts or membranes of the ear, and of the fauces, uvula, œfophagus, and the adjacent glands, to all which fteam forms an eafy and agreeable fomentation, which is much more conftant, and of eafier ufe, than gargles, lotions, and fuch like applications, which require frequent renewal, and much more effort on the fide of the patient, and motion of the parts affected, as in gargling, which is often very difagreeable when they are in an inflamed ftate.

I fhall now add fome general remarks on the compofition of a vapour bath, or of what fubftances it may confift:

On the Compoſition of a VAPOUR BATH.

A vapour bath may be conſidered, as well as a bath of water in the uſual form, as ſimple, or of the ſteam of water only, or compound, when other bodies are joined with the water, whoſe ſpecific qualities ariſe with the ſteam, and render its effects different from thoſe produced by the ſteam of ſimple water. It is relative to the laſt of theſe, viz. medicated vapour, that I here propoſe to treat.

I think it may be laid down as a general rule, that no ſubſtances can be properly employed in this way whoſe efficacious parts will not riſe along with the vapour of boiling water, and be retained (in part at leaſt) by that vapour when its heat is diminiſhed to ſuch a degree as to be tolerable to the human body in general, and even to the more tender parts of it, to which vapour is often applied.

On this account a vapour bath is much more confined in its number of ingredients than one in the uſual form; many ſubſtances which impregnate water very ſtrongly with their virtues not being ſufficiently

ficiently volatile to riſe in the degree of heat here employed, and of conſequence improper to be uſed in this way. I ſhall conſider the ſubſtances that are proper for this purpoſe, in the ſame order that I did before when I ſpoke of medicated baths.

Saline Substances.

All theſe, as being intimately and permanently miſcible with water, enter very properly into the compoſition of a bath in the common form; but only a part of them are ſufficiently volatile to riſe with the degree of heat here employed, and conſequently admiſſible among the ingredients of a vapour bath.

The vitriolic acid is, in a certain ſtate, extremely volatile; but I do not imagine much uſe could be made of this quality here, ſince, on its being diluted with water, (as would be neceſſary to be very largely done becauſe of its acrimony) it becomes fixt, and on that account uſeleſs in ſuch intention. The nitrous and muriatic acids are, in the ſtate we generally get them, ſufficiently volatile; but even theſe, when largely diluted, loſe this qua-

lity in a great degree, and the vapour arising from them in their dilute ſtate has very little acid impregnation. I never heard of any of the mineral acids being ever employed with the intention of being applied in form of vapour as a bath to the body; but I ſee Gaubius * has adviſed an antiſeptic vapour, with a view to purifying the air from peſtilential infection, which is intended to conſiſt of a mixture of the nitrous muriatic and vegetable fermented acids united with the ſteam of water.

The native vegetable acid, as found in the juices of fruits, is nearly as difficult to be raiſed in vapour as the mineral acids; but this is by no means the caſe with the vegetable

---

* Vapor Antiloimicus.

℞ Aceti vulgaris, pintas ij.
Sal marini,
— nitri,
Ol. vitrioli vulg. ana lib. ſs.
Aq. puræ, pint j. m.

S. Immiſſa in ollam fictilem vitreatam, repandam, ſuper prunas repoſita, in limine domus aut cubiculi leniter, ſine ebullitione, evaporent, & cum vapor acrior exſurgit, nova ſubinde aqua infundatur. Gaubius, de methodo concinnandi formulas medicamentorum, p. 312, 313.

In the above recipe the vitriolic acid is uſed only with intention to decompoſe the nitre and ſea ſalt, and conſequently to ſet their acids looſe from their alkaline baſes.

vegetable acid produced by fermentation, ſuch as vinegar, which eaſily riſes in ſteam, and is generally employed where an acid vapour is deſired.

The moſt common uſe of this is in topical applications, as to the mouth and fauces in the ulcerous* and inflammatory† ſore throat, to the lungs in the pleuriſy‡ and peripneumony, when it is inhaled by the breath, and ſometimes, though leſs frequently externally applied, for reſolving glandular indurations,§ as of the breaſts.

---

* And I alſo directed the fumes of red roſe-leaves, chamomile flowers, myrrh, and camphor, boiled in vinegar, to be drawn in with the breath very often, as hot as the patients could bear it, which gave great and ſpeedy relief. Huxham on the ulcerous ſore-throat.

† Vaporarium particulare, emolliens reſolvens, ad anginam inflammatoriam.

℞ Aceti ſambuci,
—— roſarum,
—— calendulæ, a ℥i.
Aq. ſtill ſambuci, ℥vi. m.

Vapor calidus hauriatur infundibuli ope in fauces. Gaubius.

‡ Vide Sir John Pringle on diſeaſes of the army, p. 144.

§ Vapor laxans aperiens diſcutiens ad mammarum tumores.

℞ Florum ſambuci,
—— chamœmel,
—— meliloti,
—— lavendulæ, ana man. j.
Sem. cumini, ℥i.
Conſciſſa, tuſa, mixta, exhibe.

 S. Species

It is either tried alone, or made the vehicle of other ſubſtances.

Sometimes, though more rarely, it is uſed in general applications to the whole body;* though in this caſe no great ſtreſs ſeems to have been laid on the efficacy of

---

S. Species, quarum pugilli duo infundantur cum aquæ ferventis & aceti vini ana ℥iv. ac per horam macerentur vaſe clauſo. Fervefacti deinde liquoris vapori nuda exponatur mamma, ſuperne ſtragula contecta; quo per quadrantem horæ continuato, molliter cum panno laneo, ſicco, calido, fricetur, moxque emplaſtro de ſpermate ceti ſuper alutam extenſo foveatur. Repetantur eadem bis, ter, quotidie; at nova quovis mane infuſio paretur. Gaubius, de formulis medicam. p. 313.

* Balneum vaporoſum univerſale nervinum antiparalyticum.

℞ Herb. majoran.
—— menth.
—— mari ſyriac.
—— fol. rec. cochl.
—— ſumm. recent rutæ,
Flor. chamœmel.
Baccar juniperi, ana man. j.

Conciſſa, tuſa, miſta, digere in phiala altâ chemicâ cum aceti & ſpir. vin. vulg. ana q. ſ. per diem & noctem.

Liquor bene calidus, una cum ſpeciebus, in ollam repandam effuſus reponatur in loculum fornicis ſudatorii ac ſcilicibus candentibus ſubinde injectis fervens detineatur. Sub fornice decumbens æger ingeſto prius decocto attenuante vapores excipiat nudo corpore ut ſudet per ſemihoram & ultra ſi vires ferunt ſudoribus deterſis fricetur pannis laneis calidis ſiccis villoſis præſertim ad partes paralyſi affectas tandemque juſculo vinoſo reficiatur. Gaubius, de form. medicam. p. 311. quoted as from Boerhaave's Mat. Medica to his aphoriſms, but not in the laſt edition.

of the acid as an ingredient in the composition.

It is neceſſary here to obſerve, that although vinegar is very properly employed in this way, on account of the volatility of its acid, yet that we muſt not expect the ſame effect from the vapour as from the contact of the vinegar itſelf, ſince the acid in the former always riſes in a more dilute ſtate. This is well known to thoſe who make uſe of vinegar for pickles, who always find that by boiling, its acidity is increaſed, which can only be by the diſſipation of its watery parts, which are firſt carried off in ſteam.

Of alkaline ſalts, the fixt alkali, either vegetable or foſſile, being not volatile in ſo ſmall a degree of heat, can have no place as an ingredient in the compoſition of a bath of this kind. But the volatile alkali is extremely well adapted for this purpoſe, being extremely volatile in the loweſt degree of heat poſſible to be employed, and is on that account in frequent uſe. It may be conveniently uſed, either by itſelf, as when the volatile alkali in a ſimple ſtate is added to the liquor from

which the ſteam is raiſed, or by decompoſition of ſome of the neutral ſalts, as ſal ammoniac, by addition of quick lime, or fixt alkali. If either of the latter of theſe be added to a ſolution of ſal ammoniac in boiling water, the volatile alkali will riſe with the ſteam in the ſame manner as if it had been in ſubſtance diſſolved in the water. I ſee volatile alkali is employed as an emmenagogue in the way of vapour, joined with other ſubſtances of ſimilar virtues, in Fuller's Pharmacopeia Extemporanea,* and think it bids fair to be full as efficacious in that as well as many other inſtances, as in any other mode of external application.

As to neutral ſalts, I never heard of any of them being employed in this intention. None, except the ammoniacal ſalts, will riſe in diſtillation without being decompoſed; and, I believe, the degree of heat which is uſually employed in this caſe is ſcarce ſufficient to elevate even the ammoniacal ſalts in any quantity ſufficient to place

* Page 324.

place any dependance on their effects. I think then that they may be excluded.

INFLAMMABLE BODIES come next under consideration:

Of these, sulphur comes first in order.

Whether this substance, in its simple state, can be admitted into the composition of a medicated vapour bath, I cannot determine: Sulphur in this state is not, properly speaking, soluble in water; yet notwithstanding, it seems capable, even when mechanically diffused, of being elevated along with the vapour of the water. This is shewn at Aix-la-Chapelle, where pure sulphur is found sublimed upon the upper parts of the passages through which the course of the spring lies. This makes it probable that it might prove an efficacious ingredient here. We know that when united with oily bodies it finds an easy admittance into the system, when externally applied. Now in this case the perspiration, which partakes of this quality in a great degree, is generally plentifully diffused over the body, being called forth by the heat and relaxing quality of the vapour.

pour. The sulphur, elevated with the vapour, will probably unite with the oily matter of the perspiration, and be absorbed into the body, whose pores are at that time in an open state.

Several natural vapour baths, of the sulphureous kind,* are found in the neighbourhood of Volcanos, where the steam issues through clefts in the rocks; and some of these are applied with success in the same disorders in which sulphureous applications are indicated. Whether these are of this kind, or of hepar sulphuris, no accounts that I have seen are sufficiently explicit to determine. If thought necessary, a vapour bath of this kind may be easily imitated in private practice.

But in my opinion, hepar sulphuris, where a sulphureous vapour is required, would be more eligible than sulphur in its native form. The former possesses all the effects, usually attributed to sulphur, with a much greater degree of volatility. That made with the volatile alkali rises more easily,

* A native vapour bath, which seems to be of the sulphureous kind, is described by Celsus near Baiæ in Italy.

eaſily, as appears by its ſtronger odour; but the hepar ſulphuris, with fixt alkali, ſerves very well for the ſame purpoſe, and I believe only differs in degree of volatility from the former, as the fixt alkali itſelf ſeems volatilized in a great meaſure by its union with ſulphur. Nay, even the combination of ſulphur with quick lime gives ſome marks of volatility by its exhaling a pungent ſulphureous ſmell when concentrated, though it loſes this, as well as its diſtinguiſhing taſte, when largely diluted with water. The warm ſprings that contain ſulphur under the above forms, afford excellent opportunities for baths of this kind, eſpecially thoſe whoſe native heat is ſufficient to exhale a plentiful vapour. Aix-la-Chapelle, whoſe ſprings are ſo extremely hot, is admirably adapted for ſuch a purpoſe, where I find it is put in execution, and uſed with good ſucceſs.* A like attempt was made at Bath, at the abbey baths, by his Grace the late Duke of Kingſton, but hitherto it has not been ſufficiently tried to aſcertain its effects.

Some

* Vide Dr. Williams on the waters of Aix-la-Chapelle and Borſet, page lx.

Some contrivance of the like kind might eafily be put in execution at the fulphureous waters in other parts of the kingdom, though thefe could not come up to thofe juft mentioned in point of convenience, as the water would require to be artificially heated for the purpofe. If the native fulphureous waters are not to be had, an artificial preparation may be eafily fubftituted, which will nearly anfwer the fame intention. When the fpecific qualities of fulphur are depended on, I think it full as likely to fucceed in this mode of ufing as if the water of a bath in the ufual form was impregnated with it.

OILY SUBSTANCES are next to be confidered.

Of thefe, expreffed oils, though confiderably lighter than water, yet require a much greater degree of heat to raife them in vapour, and are therefore improper fubjects for a trial of this kind.

But, on the other hand, effential oils are extremely well adapted for this purpofe, as they in general rife plentifully and eafily with water, and intimately blended with the fteam, though their nature is not altered

altered by the mixture. They are moſt conveniently exhibited by making an infuſion of the vegetable itſelf, whoſe eſſential oil is intended to be uſed. Sometimes Spirits of wine, or vinegar,* and ſometimes both united, are uſed inſtead of water, but I think improperly, as ſpirits of wine bring over little eſſential oil in diſtillation, becauſe they riſe with a leſs degree of heat, and conſequently come over before the oil has begun to riſe, and vinegar hardens the texture of vegetable ſubſtances, and renders them leſs apt to give out their volatile parts. Thoſe vegetable ſubſtances ſeem moſt proper for this purpoſe which contain what are called, though improperly, light oils, or thoſe which riſe with the vapour of water lightly boiling.

In general, the degree of impregnation which they impart to the ſimple water diſtilled from them, may be a good guide to our choice in this reſpect. The native † aro-

---

* Vide vapor laxans aperiens, &c. and balneum vaporoſum univerſale nervinum antiparalyticum, before quoted.

† I ſee the flowers of elder, chamœmel, and lavender, leaves of mint, marum, rue, thyme, ſcurvy graſs, ſavine, roſemary,

matic, and fœtid plants of our own growth, are generally employed for this purpose, as being cheapest, and easiest procurable, and giving out their essential oil freely to the vapour of the water in which they are boiled. In general, the aromatic plants are best suited to this purpose, as their oil rises with a less degree of heat than that of the fœtid ones. The same general rules for the preparation of the substance should be observed as are given in the two first articles of the directions for the distillation of the officinal simple waters in the Edinburgh Dispensatory.

In my opinion, this is as convenient and efficacious a manner of obtaining the effects of essential oils (with respect to their external use) as any that can be contrived, as they are applied in a tolerably concentrated form to the skin, at the time when the pores are most open to receive and absorb them.

Under this head, though not strictly belonging to it, I shall consider how far some other

rosemary, and wormwood, together with juniper and bay berries, and cummin seed, all used by Gaubius, and many more, might with equal propriety be tried.

other qualities of vegetables may be expected to be found in a vapour bath.

First, then, the gummy or mucilaginous parts, which are generally used as demulcents, or emollients. Neither of these, it is well known, rise in distillation with any heat that could be employed here, and on that account are utterly unfit subjects for a vapour bath.* On this account, Boerhaave, in his formulæ to the aphorisms,† has improperly recommended several emollient herbs with this intention, which impart no qualities to the vapour, and consequently must be at best useless, besides the hazard of their burning to the sides of the vessel, and thus tainting the steam (which is here directed to be taken in

---

* Some little of the mucilaginous parts of vegetables seems to rise in the distillation of the common simple waters, as appears by their growing thick, or *mothery* on the surface as it is called; but this is too little to place any dependance on, as it does not, when first distilled, make any perceptible difference in the consistence of the liquor.

† § 858. Vapores emollientes,
℞ Folior. malvæ,
—— bismalvæ,
—— mercurial.
—— parietar. ana man. ij.
Farin. sem. lini, ℥ii.
Cum aq. decoctum. Vaporem excipe cum aere adducendo.

in by the breath) with a nauſeous empyreumatic flavour.

Nor are the aſtringent parts of vegetables elevated in vapour, and of conſequence cannot be properly employed with this intention in a bath of this kind. This is evident from the ſimple diſtilled waters, ſeveral of which are drawn from ſubſtances that poſſeſs a pretty high * degree of this quality, yet no traces of it are to be found in the ſimple water, diſtinguiſhable either by the taſte, or the nicer teſt of their ſtriking a black colour with a ſolution of iron in an acid, although many other qualities of the plant are preſerved in a high degree. The aſtringent qualities of vegetables remain in tolerable perfection in the extracts with water,† (which is another proof of what I have juſt ſaid) though even theſe are abated in their aſtringency by long coction;

---

* As cinnamon and rue. Nay Dr. Lettſom relates a ſtrong diſtilled water drawn from a pound of green tea to a pint of water; though it poſſeſſed the flavour and other qualities of the tea in ſuch a degree as to be poiſonous to animals, yet ſtruck no black colour with ſolutions of iron in acids. A ſlight infuſion of tea, it is well known, ſtrikes a deep black colour with ſolutions of that metal.

† As in the extract of logwood, of guiacum, and of the Peruvian bark.

tion; but this does not ſeem to happen from the aſtringent quality flying off with the vapour ſo much as to its being altered in its nature by the long continuance of the heat uſed in the boiling.

The ſame obſervation holds good of the bitterneſs of vegetables. Thus we ſee the ſimple water diſtilled from rue, though it retains the whole of its ſmell, and great part of its pungency, yet has no bitter taſte, but leaves that quality entire in the extract. On this account, no vegetable ſubſtances are proper for a vapour bath that are employed on account of this quality, as it will not unite with the water in that ſtate.

Nor are the antiſeptic qualities of vegetables likely to be exerted in this form. Thoſe which are common to all vegetables ſeem to reſide in the herbaceous juice and native acid, and the peculiar or ſpecific antiſeptic qualities to be owing to the bitterneſs or aſtringency, either ſeparate, or a mixture of both, in the ſame ſubſtance, which combination is obſerved to be more powerful than either of them ſeparately taken.

Now none of the above-mentioned qualities will riſe with the vapour of water, and of conſequence the ſubſtances containing it cannot be of any ſervice with this intention when employed in this manner. For this reaſon the Peruvian bark, whoſe antiſeptic virtue is ſo great in external applications, in the way of bath or fomentation, is utterly uſeleſs in this form, as the parts on which its antiſeptic properties depend cannot be applied where we wiſh them to be exerted.* I will not deny that the eſſential oil which all aromatic vegetable ſubſtances poſſeſs, and which will riſe with vapour, may have ſome degree of an antiſeptic quality; but this can be but ſmall, as we find this property in full force both in the decoction and the extract from which the eſſential oil muſt have been diſſipated in the boiling.

Ardent

---

* The following directions of Newmann, for the choice of proper ſubjects for diſtillation, may not improperly be applied to a vapour bath:

"Vegetables in general, poſſeſſed of any conſiderable ſmell, flavour, aromatic warmth, or pungency, give over thoſe qualities to water in diſtillation, whilſt bitterneſs, ſweetneſs, aſtringent, purgative, emetic, unctuous, mucilaginous virtues remain behind in the ſtill." Neumann's Chem. page 274.

Ardent ſpirits, as ſpirits of wine, may be, and I believe frequently are employed in form of vapour, both ſimple, and as a vehicle to other ſubſtances. The former of theſe they ſuit very well, but in the latter caſe their uſe is more limited, ſince their volatility, and quality of riſing with a ſmall degree of heat, is apt to make them riſe before the heat is ſufficient to elevate the qualities of the ſubſtance they were intended to carry along with them. Thus it is obſerved of the ſpirituous diſtilled waters, that moſt of them partake leſs of the ſpecific taſte, odour, and other qualities of the ſubject, than the ſimple waters of the ſame kind, which is owing to the cauſe juſt mentioned. I ſee it is ſometimes uſed, joined with vinegar;* and their combined vapour is thought to be extremely powerful as a ſtimulant, reſolvent, deobſtruent, &c. How far it differs in its effects on the human body from that of either of the ſubſtances ſeparate, or from that of common water, I cannot determine. In general, when ſpirits are uſed for this purpoſe,

* Vide Boerhaave's formulæ to the aphoriſms, §. 1068, 1069. and Gaubius de formula medicam. p. 313.

pofe, it is fafeft to dilute them pretty largely with fome liquor, not fpirituous, as vinegar, or water, on account of the danger of their catching fire if ufed in a concentrated ftate.

The combination of vinous fpirits with the mineral acids, commonly called æther, may be properly confidered here.

Of thefe there are two kinds in ufe: The moft common is that made by the union of the vitriolic acid with fpirits of wine, and another with fpirits of wine and fpirit of nitre; both thefe are not ill fuited in their compofition for topical applications of this kind, as being extremely volatile. The great difficulty is to confine the vapour to a fixed point, and prevent its too quick evaporation; and I have feen fome very fimple machines, which feem to anfwer both thefe purpofes at once perfectly well.

I have known the vitriolic æther made ufe of in this way in diforders of the organs of hearing, but without any fenfible effect. No great fuccefs was expected, as the cafe had been of long ftanding; but the trial proved its ufe in this way to be at leaft

leaſt without danger. If thought neceſſary, it might be conveyed with equal eaſe to any other part of the body. The nitrous æther might, I doubt not, be tried with equal ſafety, as it is, if well made, equally free from acrimony; but I never had any experience of its effects.

Metallic and earthy ſubſtances, not being any of them volatile in the heat of boiling water, are entirely out of the preſent conſideration, and can never properly enter into the compoſition of a vapour bath.

Of watery bodies, or of the ſteam of ſimple water, I have before ſpoken.

Of aërial bodies, none but fixible air can be thus (medicinally) employed. This has of late years come into reputation in external as well as internal application; but in this way it is generally uſed by itſelf, and not united with vapour, and of conſequence in that light does not come under the preſent conſideration; yet I am not without ſome doubt if, in ſome caſes, it might not be more efficacious if combined with the vapour of water.

In the ſcurvy, the pores of the body are generally ſhut, and the obſtruction of the perſpiratory diſcharge is even thought, by many able writers, to be abſolutely neceſſary to the production of this diſeaſe. The good effect of the warm bath in relieving this diſorder is generally attributed to its diaphoretic qualities; but theſe are likely to be more efficacious towards the cure if conjoined with antiſeptic ones, which ſeems to be the caſe in the preſent combination. The great difficulty ſeems to be, to procure a ſufficient ſupply of fixible air for ſuch a purpoſe; but this may eaſily be done at thoſe places where any ſprings, containing fixible air, and of a ſufficient heat to exhale a plentiful vapour, break out, by conveying the water as ſoon as poſſible after its riſe under a floor perforated in many places for the paſſage of the vapour upwards. Several contrivances of this kind are to be found at the foreign hot baths, and might eaſily be executed in our own country.

If intended for topical application only, it may be eaſily uſed in any place, by adding the fermenting ſubſtances ſeparately

to

to the water (firſt heated) from whence the ſteam is to riſe.

Fixt air ſeems to unite well with water in a ſtate of vapour, as it does with it when in its uſual form, and on that account is properly combined with ſteam.

I have thus finiſhed the firſt part of this work, which I mean as explanatory of, and introductory to, what I ſhall ſay in the ſecond part, on the external uſe of the Bath waters. It has indeed run out to a greater length than I either wiſhed or expected, yet I could not ſhorten it upon the preſent plan, and only fear the reader will find it in many parts rather defective than redundant. But I ſhall reſerve my apologies to the end of the whole work.

Since the firſt part of this work was printed off, the following accounts of the effects of warm bathing were communicated to me by my ingenious and worthy friend, Dr. Haygarth, of Cheſter.

Experiment I.

A perſon in the hoſpital there, of 34 years old, whoſe complaint was a pain of the

the ſhoulder, unattended with fever, was on June 20th, 1774, at ſeven in the evening, put into the warm bath. The heat of the bath room was 60 degrees, that of the bath itſelf 105. Some time during his immerſion, a douche, or ſtream of water was let fall on his ſhoulder, of 124 degrees of heat. His ſtay in the bath was 15 minutes. Before immerſion the pulſe beat 86 times in a minute, and during immerſion 110 times. The heat of the hand before going into the water was 98 degrees, during his ſtay in it 102. The urine ſecreted in the hour before bathing amounted to ſix ounces, but in the hour enſuing only to three ounces. The weight of the patient before bathing was 191lb. and after it 190½lb. Sweat moderate during the time of bathing, and afterwards.

EXPERIMENT II.

A perſon in the ſame hoſpital, aged 31 years, under a venereal complaint, was at nine in the evening put into a bath of 110 degrees of heat. The pulſe before going in beat 64 times in a minute, during his ſtay in it 120, and after coming out 80. The time of immerſion was ten minutes.

The

The weight of the body before going into the bath was 143lb. ℥iv. and after coming out 143lb. ℥iiiſs. The ſweat was profuſe, and the veins appeared ſwelled.

EXPERIMENT III.

Some time afterwards, the laſt-mentioned patient was again, at five in the evening, put into a warm bath of 114 degrees of heat, and ſuffered to remain there 15 minutes. The weight of the body on going in was 143lb. ℥iv. and after coming out 143lb. ℥iiiſs. as before. The pulſe beat before bathing 73 times, during the ſtay in it 114, and after coming out 78 times in a minute. Sweat profuſe, and veins ſwelled.

EXPERIMENT IV.

A perſon under the ſame complaint, 42 years of age, at five in the evening went into a bath of 114 degrees of heat, and remained there 15 minutes. The weight before immerſion was 154lb. ℥iv. and the ſame on coming out. Pulſe beat before 65, during the ſtay in the bath 110, and afterwards 84 in a minute. Sweat profuſe, and venous ſyſtem ſwelled.

EXPE-

EXPERIMENT V.

A perſon in the laſt-mentioned diſorder, aged 34 years, was at the ſame hour mentioned in the laſt caſe put into a bath of 114 degrees of heat, and kept there 15 minutes. The weight before immerſion was 123 lb. and the ſame afterwards. The pulſe before entering the bath beat 62, during the ſtay in it 69, and after coming out 60 times in a minute. Sweat profuſe, and veins ſwelled.

EXPERIMENT VI.

A perſon aged 34 years, with a fixt pain in the ſhoulder, but without fever, was at five in the evening put into a bath of 93 degrees of heat, and remained in it fifteen minutes. The pulſe before going in beat 72, during the ſtay in it 84, and after coming out 70 times in a minute. The ſweat was little, and the veins not obviouſly enlarged. The urine ſecreted in an hour and 40 minutes before uſing the bath amounted to ℥vi. and nearly that quantity was ſecreted in the like time afterwards.

The above experiments agree nearly with thoſe made by Dr. PARR on the ſame ſubject.

ject. The pulse in all was rendered quicker, the perspiration increased, and the veins swelled, when the water rose above 100 degrees. Below that mark it increased the number of the pulse, but the perspiration and venous system were not obviously affected. Dr. Haygarth's experiments were made with a considerably greater heat than Dr. Parr's; yet I do not find by his account that any inconvenience ensued. It is likewise observable, that in the first experiment of Dr. Haygarth's, the heat of the bath, when as high as 105 degrees, evidently diminished the urinary secretion, and when as low as 93 degrees, did not seem to promote it, which the warm bath did, in Dr. Parr's experiments, when as high as 96 degrees. But these differences must be expected in various trials; and I am rather inclined to think that Dr. Parr would be generally in the right, as his experiment was more frequently repeated, and with nearly the same event, and as it seems to be the most probable course the absorbed fluid could take, as it scarce seemed to increase any of the other evacuations.

In order to throw ſome light on the queſtion of the fluids' abſorption, Dr. Haygarth procured the patients to be weighed before going into the bath, and on their coming out again. In two inſtances the weight had not ſuffered any ſenſible alteration, and in three others it was rather diminiſhed. This might ſeem to make againſt the theory of abſorption; but it ſhould be conſidered, that the difference of weight proves only the difference between abſorption and the evacuation by ſweat, inſenſible perſpiration, &c. which were here probably very large. Dr. Parr mentions in his experiments, that at 106 degrees the ſweat flowed in full ſtreams down the face, and certainly this evacuation muſt have been much greater in theſe inſtances, in one of which the heat was raiſed 4 degrees, and in three others 8 degrees higher than in Dr. Parr's experiments. The loſs of weight was obvious, and neceſſary, and how this could have been replaced, except by abſorption, I am at a loſs to imagine. I have no doubt then that the abſorption, as well as evacuation, is very conſiderable; but at the ſame time I confeſs I ſee no clear method of proving the

the real quantities of either. They both ſeem to vary greatly under different circumſtances. I have before related in ſome experiments at the beginning of this work, that I found the abſorption greateſt when the perſpiration was leaſt, as in cold weather, and before meals,* and vice verſâ; and probably, by the accounts we have of its effects in fevers, of rendering the mouth moiſt, and increaſing the other ſecretions, it is ſtill greater in ſuch circumſtances, eſpecially

* When the ſtomach is empty, it has been long obſerved, that the body is in an abſorbing ſtate, even from the air. Dr. Chalmers, in the well-known ſtory of the negro, (who, to the diſgrace of our countrymen, and of human nature, was gibbetted alive by his inhuman maſters in South Carolina, and expoſed to periſh by hunger and thirſt, and the ſcorching rays of a tropical ſun) relates, that though neither meat or drink were given him, he regularly voided every morning a large quantity of urine. The dews of the evening, as Dr. Percival obſerves on this caſe, imbibed by the body, ſupplied a ſuperabundance of fluids in the night, and a ſufficient quantity to ſupport perſpiration in the day. I much ſuſpect that had Dr. Haygarth made theſe experiments in a cold ſeaſon, and in caſes attended with a defect of perſpiration, as in fevers, the abſorption would have been found much greater. In the experiments I have related myſelf, the abſorption was probably greater than what is computed, as no account was made for the perſpiration, which muſt certainly have increaſed the bulk of the water. Probably to this is owing the fact which has been long obſerved, that infection is more apt to be taken from contagious diſtepmers when the ſtomach is empty than when full, and the caution ſo often given to phyſicians not to go out to viſit ſuch patients without previouſly taking in food.

especially if we give credit to the story related by Dr. Simpson, of St. Andrews, before mentioned.

The above experiments of Dr. Haygarth's confirm greatly, in my opinion, the theory of the expansion of the blood by heat, since, without any increase of quantity of fluid, and without any partial derivation of it to any particular place, except perhaps to the surface of the body in general, which yet we have no proof to support, the veins appeared enlarged, even on the face, which the water did not reach, and consequently could not directly act on by its relaxing qualities.

As to the other effects, they seem to agree as far as related with those which I represented it to possess, being evidently stimulant at first, and rather sedative in its consequences. In two of the cases mentioned the pulse was slower after the trial of the bath than before it, and probably this would have been the case with more, had the examination been delayed a little longer 'till the stimulant effects had ceased. The increase of the diaphoretic secretion was also very remarkable. The diuretic quality

quality of the warm bath ſeemed indeed to fail; but it was only tried in one inſtance, where the heat was ſuch as this effect could reaſonably be expected, and its failure of exciting this ſecretion probably owing to ſome particular diſpoſition of the patient. As to the other effects, they are either leſs remarkable, or elſe of a ſecondary nature, and of conſequence do not come under the head of experiments made to determine its immediate effects.

PART I.

On the External Uſe of the Bath Waters.

I Come now to the Second Part of this volume, in which I propoſe to apply what has been obſerved of warm bathing in general to the external uſe of the Bath waters.

In doing this, I ſhall follow as nearly as poſſible the ſame order with that obſerved in Part I.

Firſt, then, as to the heat of the Bath waters.

In this view, the Bath waters may be conſidered as warm baths, from 112 degrees (which is the heat of the hotteſt part of the King's Bath) when uſed as general baths, to any degree below that point

point that may be desired.* In topical applications, as pumping, the heat may be raised higher, to 116 degrees, owing to the surface of the water not being exposed to the air, as in the bath. In this respect the Bath waters possess all the advantages of which thermæ are capable, as the above-mentioned degrees are equal to any effect that we should wish to be produced by a warm bath on the human body by a considerable heat, whilst at the same time they possess all the advantages of other natural springs of an inferior degree, to which their heat is easily reducible, if their native one be too great. This is a circumstance of great consequence with respect to topical applications, as pumping, which is of little efficacy, unless the water be at least as warm as the body to which it is applied.

As to the quality of the fluid :—

In this light the Bath waters may be looked on as medicated baths, consisting of

---

* A warm bath of the Bath waters, of any inferior degree of heat, may be had at the Abbey baths; and the same is intended to be put in execution at the Hot bath by the Corporation, but is not yet finished. In the present state of the public baths, the heat is scarce ever below 102 or 100 degrees.

of hepar ſulphuris, with quick lime, ſelenites, common ſalt, a ſmall portion of iron, (diſſolved by means of the vol. vitriolic acid) and fixible air, united with water. For the experiments in proof of the ſubſtances that enter into their compoſition, I refer to vol. I.

As to their effects on the body, I ſhall ſpeak of them comparatively with thoſe of ſimple water.

First then, as to its effects on the ſurface as detergent.

Bath waters as detergent.

Viewed in this light ſolely the Bath waters are inferior to ſimple water. They curdle ſoap, and are found improper for waſhing linen, and other domeſtic purpoſes in which this quality is required. Of courſe then, where cleanſing the ſkin from adhering foulneſs was the ſole object, a bath of ſimple water would be preferable; but this indication rarely occurs in medicine; and moreover, the difference of effect, even in this reſpect, upon the human body is ſo ſmall as not to merit much regard.

As soften-ing and relaxing the cuticle.

I believe, likewise, that it is less powerful than simple water in softening and relaxing the cuticle;* probably on account of its astringent and saline ingredients; but this difference also is too trifling to make any variation in its effects of any consequence in medicine.

As anti-septic and astringent.

Bath waters likewise possess an antiseptic and astringent quality, neither of which belongs to common water. But whether these are in sufficient degree to be of much importance, merely as acting on the surface of the body, exclusive of the consideration of the waters being absorbed, I am in doubt.

As to the quantity absorbed.

I do not find any difference worthy notice between the Bath waters and simple water relative to the quantity absorbed.

As to their rarefying effects.

As to the rarefying effects of the Bath waters on the fluids of the body, it is obvious that they must be the same with those of common water of the same degree of heat.

As

* I found a piece of meat much softer after being boiled an equal time in river water, and even in common spring water, than when Bath water was used.

The mechanical operation of the Bath waters on the body then do not differ ſenſibly from common water; but when we conſider their action upon the nervous ſyſtem, the variation is more evident.

If their ſpecific qualities can be abſorbed by the ſkin from their uſe as baths.

Some gentlemen of the profeſſion, for whoſe opinion I have the higheſt regard, have expreſſed great doubts to me if the Bath waters, externally applied, could differ in their effects on the body from common water of the ſame degree of heat. Not to inſiſt at preſent on the general opinion of mankind, or on any particular comparative facts relative to their reſpective effects, which ſhall be afterwards related, I confeſs, in point of argument, I can by no means ſee any reaſon why a fluid, whoſe effects taken into the ſtomach are ſo different from thoſe of common water, might not exert different ones applied to the ſurface of the body. The abſorption of fluids by the ſkin is a point, I think, as well aſcertained as moſt in phyſiology; and we find, by the beſt accounts likewiſe, that no decompoſition or alteration of nature happens in the ſubſtances diſſolved in the abſorbed fluid. Dr. Alexander found nitre more diuretic in this mode of exhibi-

tion than when taken by the mouth, and the bark to be equally efficacious in the cure of an intermittent; the firſt of which experiments I have myſelf ſeveral times repeated, always with ſucceſs. The particles of cantharides, externally applied, affect the neck of the bladder in the ſame way as taken internally; and I have even ſeen this happen in a ſlight degree from the uſe of an embrocation, in which tincture of cantharides made a large proportion, although not ſufficient to veſicate the ſkin.

Tinct. Thebaica likewiſe, externally applied to the pit of the ſtomach, is a common and efficacious remedy in the ſtopping of vomiting, as I have myſelf more than once experienced.

Some of the ſaturnine preparations alſo, externally uſed, have affected the part to which they have been applied, and ſometimes the whole ſyſtem, in the ſame manner as might have been expected from their internal uſe.

If the effects of medicated ſubſtances have been thus exerted in external topical application, I ſee no cauſe to deny our aſſent to the poſſibility of the Bath waters exerting

exerting their ſpecific effects when applied to the whole body, where the ſurface is ſo much larger, and probably ſome parts of it more abſorbent than thoſe to which topical applications are generally made. The chalybeate, ſulphureous, and aërial impregnations, are held in perfect ſolution by the waters, and therefore as likely to be abſorbed together with the fluid, as the ſolution of nitre before mentioned, and more ſo than the ſpecific qualities of the bark, whoſe union of its active particles with water is much leſs compleat.

It ſhould ſeem that when we deſire to introduce any medicines into the body, to alter the quality or conſiſtence of the fluids, as diluent or antiſeptic remedies, or to affect the glandular ſyſtem, that this method would be preferable to taking them by the mouth, as they would be more immediately conveyed to the parts deſired without ſuffering any alteration from the digeſtive proceſs.

But to return to the ſubject:—

Bath waters more ſtimulant than common water.

The Bath waters, uſed as a bath, are more ſtimulant than common water. I

have found, by repeated experiments, my own pulse increased both in number and strength more by a pediluvium of the Bath water than by one of simple water of the same heat. The former increased the number from 12 to 16 beats in a minute, but the latter never exceeded 9, and seldom so many. I have not had myself an opportunity of observing the comparative effects of Bath water with simple water, when used as a bath to the whole body; but I have observed of those who bathed in the baths here, that the pulse has been more increased in number by the same degree of heat, than is mentioned either in Dr. Parr's or Dr. Haygarth's experiments * on that subject. I have almost always found the pulse raised to 120 in a minute, and this in a shorter time than Dr. Parr mentions, and in subjects where I had no reason to suspect any increased irritability. The same gentleman relates, that after bathing, the body broke out into violent sweats on the least motion through the rest of the day. I have

* I tried these experiments at the Duke of Kingston's bath, where the heat is equable in every part of it, which is not the case in the public baths. The heat of them, when at the highest degree, is from 104 to 105 degrees.

have often enquired of thoſe who have bathed here, if this effect was ſimilar in them to that juſt related, and much the greateſt number have aſſured me that this tendency was very little increaſed, and in ſeveral not at all. And ſo far from being relaxed or weakened by its uſe, I have generally found that the bathers were more alert and vigorous, and had a better appetite on the days of bathing than in the intervals.

The bath guides likewiſe, many of whom every morning remain ſeveral hours in the water, do not ſeem at all relaxed or weakened by ſuch a practice, but on the contrary are in general robuſt, vigorous, and long lived, and moſt of them inclining to corpulency.

Fainting, likewiſe, which a warm bath of common water is ſo apt to induce, happens very rarely in theſe baths, although the ſtay is generally longer than in a common warm bath, and the people who uſe it are often in a very weak ſtate both of ſtrength and ſpirits.

Dr. Charleton likewiſe relates a caſe of a paralytic patient, whoſe lower limbs had

loſt

loſt both motion and ſenſibility. The warm bath was tried on her with a temporary relief during her ſtay in it, but on coming out both motion and ſenſibility were again preſently loſt. The Bath waters, externally uſed in this caſe, entirely cured her, which was probably owing to their ſuperior ſtimulus, which appears in this caſe not only to have been greater, but more durable.

More antiſpaſmodic.

I am likewiſe inclined to think the Bath water more antiſpaſmodic than common water, uſed as a bath. But here I would be underſtood to mean ſuch caſes only where ſtimulants are proper, as its ſuperior antiſpaſmodic quality ſeems to depend on its greater ſtimulus. A comparative proof of this quality is difficult to aſcertain by poſitive experiment, as the ſimple warm bath itſelf poſſeſſes it in ſo great a degree, independent of any impregnation. But the ſudden and quick relief procured by bathing here in caſes of the ſpaſmodic kind, the obvious ſuperior ſtimulus of the Bath waters, which is here indicated, their great antiſpaſmodic qualities taken internally, and the great reaſon we have to think theſe may exert their proper and ſpecific

ſpecific qualities on the nervous ſyſtem, even when externally applied, give us the greateſt reaſon to think that the opinion of their ſuperior efficacy in this way is not ill founded.

Whether the Bath waters uſed in this way are more diaphoretic than common water, I cannot determine. The perſpiratory diſcharge in both is very conſiderable, but I ſuſpect leſs in theſe baths than in ſimple water, probably on account of ſome of the ſaline and aſtringent parts in their compoſition. I have obſerved ſeveral whoſe ſtrength would ill bear a large evacuation of this kind, (which an ingenious writer obſerves, and what I have found by experience to be true, to be the moſt weakening of any, in proportion to its quantity) endure bathing in the public baths here without any loſs of ſtrength, but rather an increaſe of it. This, no doubt, was in part owing to the ſtimulant and corroborant qualities of the waters, which prevented ſo great loſs of ſtrength; but I am inclined to attribute it in ſome degree to the evacuations not being ſo great, which I have often obſerved. I have before mentioned, that the tendency to

Probably leſs diaphoretic.

to perfpire during the day after is much lefs than when common water is ufed, and likewife, that it promotes an evacuation of another kind confiderably more than common water, which is feldom the cafe when that by perfpiration is increafed at the fame time.

More diuretic.

I find, from repeated experience, that the Bath waters, ufed in this manner, are more diuretic than a bath of fimple water. Dr. Parr found, in his experiments, that the urinary fecretion was not increafed when the heat of the water rofe above 96 degrees; and Dr. Haygarth mentions, that as low as 93 degrees it was not obvioufly augmented; and when as high as 105, diminifhed one half. But I have frequently obferved this fecretion to be increafed when the heat of the water was greater than any of thefe here mentioned, and fcarce ever found it diminifhed.

I have found, likewife, in feveral cafes, the Bath waters to promote expectoration very powerfully; but whether they do this in a greater degree than common water, I have not had an opportunity of afcertaining by experiment.

The

The ſame is true of their effects in promoting the ſalivary diſcharge. But their comparative qualities are here of little conſequence.

The Bath waters prove likewiſe very efficacious in promoting the menſtrual diſcharge, and I think more ſo than can be reaſonably attributed to common water. But of theſe I have not had an opportunity of a fair comparative trial. Of this, as a ſecondary effect, I ſhall ſpeak more when I come to treat of the indications for which the waters are adapted.

INDICATIONS *of* BATH WATERS.

In treating of theſe, I ſhall not repeat what has been before ſaid of the mechanical action of the warm bath on the human body, or of the indications derived from thence, but refer back for an account of theſe to the firſt part of this work, as the Bath waters are not ſuppoſed to poſſeſs theſe in a greater degree than common water.

I ſhall therefore proceed immediately to ſpeak of it as indicated from its effects on the vital and nervous ſyſtem.

First,

As stimulant.

First, then, of the Bath waters as stimulant:—

Of disorders that require medicines of this kind, the palsy is the principal.

In palsy.

The use of the Bath waters externally in this disorder is almost as ancient as any accounts we have of them. Notwithstanding the many relations from the best authorities of their general success in this disorder, the late Dr. Mead, undoubtedly from very partial experience, has utterly condemned their use, in the most positive terms, in every species and stage of this complaint. Indeed, his general observation on warm bathing in this disorder, seems only to be drawn from what he has remarked of the Bath waters, which were less liable to such an imputation than common water. But this charge has been already refuted, with invincible argument and authority, by the ingenious and learned Dr. Charleton, who has proved, in the clearest manner possible, that Dr. Mead's opinion was not only contrary to that of others, the most eminent in their profession, and whose sentiments on this head were founded on actual experience, but also

also repugnant to the most indubitable authority in point of fact. It appears by the register of the Hospital, that from May 1751 to 1764, 1053 paralytic patients were admitted, out of which 813 were cured or benefited, and only 43 died in the hospital;—a very small proportion in so dangerous a distemper, and what fully confutes Dr. Mead's assertion; who has represented the bad effects of the Bath waters as exerted in bringing on an apoplexy just after their coming out of the bath; so that the deaths caused by the Bath waters must have most of them come into the hospital account, as the effects were so immediate. But I do not find, by the best inquiries I can make, that of those who have died of this complaint during the use of the waters, that more of them died soon after coming out of the water* than any other time. Accidents of this kind may, no doubt, happen; but as Dr. Charleton observes, very judiciously, "why "ascribe the return of the disorder to the "use

* Ipse quidem novi nonnullus qui cum vana medicorum spe delusi ad thermas nostras Bathonienses profecti essent ex aqua calida egressi mox iterum apoplexia correpti sunt ac periere. *Mead. monita & precepta medica.*

"use of warm bathing? since this disaster happens to those who have never used the warm bath." For my part, if this accident should happen, I should no more ascribe it to the warm bath than to the bed from whence he arose that morning. It is natural, as the excellent writer, before quoted, observes, "for men to be governed in their judgments by what falls under their own observation; hence it is that we are too apt to draw general conclusions from the bad or ill success of a few particular cases; but it is on full and repeated experience, not on partial or casual, that aphorisms in the art of medicine are to be drawn, or can be well founded; and therefore, as the evidences here are both numerous and decisive, I shall not hesitate to affirm, whatever authority there may be to the contrary, that bathing in Bath water is useful in palsies."

Having ascertained this general position, I shall now enquire to what kinds of paralytic complaints the Bath waters are best adapted.

First,

First, then, they are obſerved to be particularly efficacious in thoſe paralytic complaints that owe their origin to external cold. This is a very common cauſe of paralytic diſorders among the lower ranks of people, eſpecially if moiſture be mixed with it, and the tranſition from an increaſed heat to a conſiderable degree of cold be ſudden. Boatmen, fiſhermen, and others, whoſe occupation leads them into the neceſſity of remaining long in cold water, are frequent ſubjects of this diſorder, and make no inconſiderable proportion of thoſe admitted into the Bath Hoſpital. The ſucceſs of the baths in ſuch caſes is in general very happy, and ſometimes ſucceed when the diſorder has remained a long time; though ſuch caſes often require a long ſtay to compleat the cure. Out of twenty-four patients of this kind received into the Bath Hoſpital from May 1751 to May 1764, only two received no benefit, and none died in the Hoſpital;—a convincing proof of the efficacy,* and likewiſe of the ſafety of the baths in ſuch caſes. Palſy from cold.

I have

* The baths of Aix-la-Chapelle, which are of the ſulphureous kind, are found very ſerviceable in this kind of palſy. Vide Dr. Williams's Treatiſe, caſe xiii. xiv. xv.

Palſy from heat.

I have likewiſe ſeen an inſtance wherein the Bath waters proved extremely efficacious in the cure of a paralytic ſtroke, owing to an oppoſite cauſe, violent heat. This often happens, it is ſaid, in hot countries to the reapers and mowers,* from inſolation or expoſure to the ſun's rays, which was the caſe in the preſent inſtance. Various remedies were adminiſtered before a trial was made of the Bath waters, but all without effect; but after bathing and pumping a fortnight, he was perfectly reſtored. The palſy in this caſe was of the general kind, and deprived the patient of the uſe of his limbs and ſpeech almoſt entirely.

The Bath waters are likewiſe very efficacious in ſeveral paralytic affections, which are either the imperfect criſis of other diſorders, or their immediate and natural conſequence. Of this kind is the palſy† which

* Van Swieten obſerves, that country people ſometimes become paralytic from ſleeping, expoſed to the ſun; and quotes Hippocrates for a ſimilar obſervation on the expoſure of the head to the ſun in hot weather. Van Swiet. Comm. vol. III. p. 361.

† Sauvage obſerves of this complaint, that it is exaſperated by the ſaline mineral waters, but relieved by the ſulphureous ones.

which frequently succeeds the chronic rheumatism, which last itself seems nearly connected with a paralytic affection. Of these, twenty-two out of twenty-seven were cured or benefited in the Bath hospital by warm bathing, three were no better, one died, and one improper to be continued. Palsy from rheumatism.

The external use of the Bath waters is likewise equally effectual in those paralytic complaints which succeed fits of the gout,* and which are nearly allied to the foregoing. Palsy from gout.

* The good effects of the Bath waters in such cases is described by Dr. Musgrave:—

Quum vero sinistri lateris quædam maneret imbecillitas, illius causâ Bathoniam meo hortatu, petens, thermas ingressus est; unde artuum qui defecerunt vires & robur pristinum redintegratum habuit, ex illoque tempore, subinde dolens articulis, annos ille permultos egit, *apoplexia* & omni capitis insultu liber, non nisi senio demum confectus. Musgrave, de arthritide anomala, p. 438.

Had this been written after Dr. Mead's Monita et Præcepta Medica were published, it would have appeared as if inserted to contradict his assertion concerning the bad effects of the warm bath in palsy.

Dr. Musgrave likewise relates another instance of the good effects of the Bath waters, externally used, in a palsy succeeding the gout, and attended with a bilious colic. p. 444.

Palsy from colic.

The Bath waters likewise, used in this manner, afford great relief in those paralytic disorders that are consequent on bowel complaints, especially such as are contracted in hot countries, and generally accompanied with bilious symptoms, as the West-India colic, commonly called the dry belly-ach, violent bilious colics, &c.

Dr. Charlton relates two instances of this kind,* wherein bathing and pumping were of the utmost service, though under the most unpromising circumstances.

Palsy from fevers.

Fevers likewise, when they go off without a due crisis, often produce much mischief to the constitution; and of these, palsies are no unfrequent consequence. In the cure of these the Bath waters, externally used, are very successful. Dr. Charlton relates three cases at length of such complaints, which were all perfectly cured by these means; and by the hospital register it appears, that out of seventeen patients affected in this manner, thirteen were

* By Dr. Baker's account it seems very probable that all these colics which produce palsy are caused by lead, and, consequently, that these might be referred to this head.

were cured or benefited, and only two received no relief.

The Bath waters have likewise sometimes been found of service in paralytic disorders arising from scrophula, which might, a priori, be reckoned amongst the most incurable of any, as it might be supposed it would scarce produce this effect, except the nerve itself was corroded by the acrimony of the scrophulous poison; yet by the hospital register it appears, that one out of two who were admitted under such circumstances received relief; but I imagine this may well be esteemed among the most doubtful cases, though still worthy of trial. Palsy from scrophula.

The baths at this place also are found extremely serviceable in those paralytic disorders which are caused by mineral poisons, of the metallic kind especially. Palsy from poison.

The principal of these is lead, whose effects on the human body have been lately accurately described, as well as the means by which it is most likely to gain admission into it, by Dr. Baker and Dr. Percival. One of the most dreadful consequences of this poison is palsy, of the Lead.

 hands

hands eſpecially, though not unfrequently the lower limbs are affected in like manner.

In theſe caſes the bath generally proves ſucceſsful,* except the diſorder has been of long ſtanding, and neglected; but even theſe diſcouragements ought not to make us deſpair of aſſiſtance in this ſpecies of palſy, ſince the bath will often give at leaſt great relief, even in the moſt unpromiſing circumſtances.

Dr. Charleton relates two caſes, in one of which the bath was not tried until one-and-twenty months after the ſeizure; and another, wherein ſeven months were elapſed after a ſecond attack before the patient came to the bath; yet, notwithſtanding, both of them perfectly recovered.

By the hoſpital accounts it appears, that out of forty patients admitted for the palſy from mineral effluvia, moſt, if not all, of

---

* Sulphureous baths have been long celebrated in this ſpecies of palſy.

Sulphuratæ adhibeantur thermæ quarum centies exploratus conſtat effectus pluribus inſanis incaſſum tentatis pareſin quæ colico ſupervenerat dolori thermis Aquis-granenſibus ſanavit Foreſtus. *Tronchin*, cap. xxxi.

of which were caufed by lead, thirty-eight were cured or benefited. But this catalogue is, in reality, much larger: for it appears by the fame regifter, that 237 patients were admitted for palfies, from the cyder and bilious colics, which is only the palfy from lead * under a different name; and out of thefe, 218 were cured or benefited, only five received no benefit, and nine died.

This diforder fhews an inftance of the fuperiority of the Bath water, externally applied, to common water. In the London hofpitals, where this diforder is extremely frequent, and where warm bathing is frequently ufed as a remedy, it is obferved, that moft of the cafes admit of cure when the mufcles that form the ball of the thumb retain their plumpnefs and fize; but, as often happens in the advanced ftate of this difeafe, when thofe are greatly wafted, the cafe is almoft always incurable by their remedies. But the Bath waters have been found frequently fuccefsful, even after the appearance of this fymptom,

* Vide Medical Tranfactions, vol. I. p. 334, 335, 336.

tom, in removing the paralytic affection; but, I believe, the muſcles of the hand, which are waſted, ſcarce ever recover by any remedies.

Mercury.

The Bath waters thus applied are likewiſe very ſucceſsful in thoſe paralytic affections that ſucceed the taking a large quantity of mercury into the body, to which gilders, refiners, and others who work in this metal, and eſpecially thoſe who are expoſed to its fumes, are ſubject.

Suppreſſion of natural diſcharge.

Sudden ſuppreſſion of natural diſcharges will ſometimes give riſe to this complaint. Dr. Charlton gives an account of a caſe of this kind, which was cauſed by menſtrual obſtruction, and was perfectly cured by bathing in the Bath water; the ſuperiority of whoſe efficacy to common water was here very apparent.

In the hoſpital regiſter two only are mentioned as being paralytic from this cauſe, both of whom were cured or benefited.

The ſame author has related the hiſtory of a caſe where the ſame effect was produced by the premature ſtoppage of the lochia

lochia in a lying-in, which was greatly relieved by the warm bath at this place.

The ſtoppage of the hæmorrhoidal diſcharge likewiſe in thoſe who have been ſubject to this evacuation will, as Hippocrates obſerves,* cauſe diſorders of this kind. I have not, indeed, ſeen any inſtance of this kind at this place; but, from analogy, the ſafety and utility of the Bath waters may, with the greateſt probability, be inferred.

A cauſe, directly oppoſite to that juſt mentioned, will ſometimes produce the ſame effect, viz. *exceſſive evacuation*, of blood eſpecially. Several of the palſies which happen to women in their lying-in ariſe from immoderate diſcharges by flooding, and in theſe the Bath waters are in general ſucceſsful.

I have myſelf ſeen a very remarkable caſe which aroſe from a cauſe ſimilar to the foregoing, viz. immoderate menſtrual diſcharge, in which the Bath waters, thus uſed, were of the utmoſt ſervice, and evidently

* Coacæ Prænotiones, No. 346.

dently recovered the patient from as deplorable a ſtate of this kind as can well be imagined; and this after the moſt approved medicines commonly uſed in ſuch circumſtances had been tried without effect.

The efficacy of the Bath waters is likewiſe very great in thoſe palſies that ariſe from external accidents. Dr. Charlton relates two remarkable caſes of this kind, in the firſt of which the patient did not make trial of the waters until upwards of a year after the accident, and, notwithſtanding, received great benefit. In this caſe the palſy aroſe from the origin of the nerves in general being affected by a blow on the cerebellum; in the latter caſe it was apparently owing to the compreſſion of the ſpinal marrow, by the diſtortion of the third and fourth vertebræ of the neck. The laſt patient was not admitted until ſix months after the accident, at which time the vertebræ were ſtill diſplaced, and his lower limbs paralytic. But by uſing the waters, in the way of pumping, the vertebræ regained their natural ſituation, the perfect uſe and feeling of his limbs returned, and all his complaints ceaſed.

It

It appears likewife, by the hofpital regifter before quoted, that out of nineteen paralytic patients, from external accidents, who were admitted in the fpace of thirteen years, fixteen were cured or benefited, and one only died.

The dead palfy, as it is called from the lofs of fenfation accompanying that of motion, is generally accounted one of the worft * kinds; yet in this the Bath waters have been found remarkably fuccefsful.

Dr. Charlton relates two cafes of this kind, both of which were perfectly cured: and by the hofpital regifter, before quoted, it appears, that only three of this kind were admitted, all of which were cured or benefited.

In thofe palfies that are attended with tremor of the parts affected, and fometimes of the whole body, called fhaking palfies, the

* Aliquando, licet rarius eft, una cum motu, omnis fenfus abolitus eft & quidem malo omine. Van Swieten, §. 1057.

Cum autem dictum fuerit, quandoque una cum motu, & fenfum omnino perire in parte paralytica, merito & hoc pro malo omine habetur, quia caufa paralyfis non tantum nervos moventes, fed & fentientes impedit, adeoque fatis valida eft. Van Swieten, §. 1062.

the Bath is less successful. Dr. Charlton observes, and I have made the same remark from my own observation, that unless they are the consequences of some acute disease, or of suppressed gout, they seldom receive any considerable benefit from the waters. By the hospital account, it appears, that out of five palsies of this kind, one only received any benefit.

I have likewise observed that the Bath waters, used as baths, are seldom successful when the paralytic parts are disposed to a large discharge by perspiration.* This has been observed by Boerhaave and others to be a bad sign, except it proves immediately critical by a relief of the symptoms. This disposition the Bath waters, and I suppose every warm bath likewise, are apt to increase, and therefore in such cases are justly forbidden.

The bath is likewise often unsuccessful in disorders of this kind in general, when of

---

* Si sudores paralysin non statim curent, eam fere semper incurabilem reddunt, & hoc in multis accidit. *Duretus.*

Diaphoresis non omnibus convenit & biliosis sæpe officit. *Willis,* speaking of the palsy.

of long ſtanding, and therefore the ſooner they are applied to after the attack, the greater are the hopes of relief.* But this is common to them with other remedies, and indeed leſs applicable to them, as they have frequently ſucceeded when the diſorder has been of too long ſtanding to be affected by other applications.

The Bath waters have likewiſe been found of the utmoſt ſervice on account of this quality in the chloroſis, eſpecially when attended with inertia, paleneſs, want of appetite, and muſcular relaxation.— Many caſes of this kind are given by ſome of the old writers, which, though very inaccurate, ſufficiently prove the efficacy of theſe waters, externally uſed, as well as internally, in this complaint. Hippocrates † adviſes the frequent uſe of the warm bath, and of an aromatic fumigation at the ſame In the chloroſis.

* And I muſt alſo obſerve, that the length of time in which the patient hath laboured under the complaint (as in every other ſpecies of palſy) proportionably retards the cure; for I am perſuaded that theſe waters would prove more effectual than they often do, were they applied to as ſoon as poſſible after the attack. Charlton's inquiry, p. 40, ſpeaking of the hemiplegia.

† De ſuperfœtatione, §. xxiv.

ſame time; and Van Swieten * adviſes a medicated bath of aromatic herbs to increaſe the ſtimulant and corroborating quality of it, and expreſsly with an intention that the active ingredients might be abſorbed into the courſe of circulation. In order to guard againſt its relaxing qualities, he directs friction to be uſed with it.

The Bath waters fulfil all theſe intentions incomparably well, being more ſtimulant than common water, and at the ſame time free from the nauſeous ſmell of the ingredients commonly uſed on ſuch occaſions.† I ſhall only obſerve farther, that it is beſt adapted to that ſpecies of this diſorder

* Comm. §. 75.

† Dr. Sydenham's advice will have no ſmall weight in this place:——" Sed ut hoc ſit, ſi ob contumaciam ejus hic adfectus ferreis aquis minus cedat, adeundæ ſunt aquæ calidæ ſulphureæ, quales ſunt noſtræ Bathonienſes; atque æger poſtquam tribus auroris continuis eas intus adſumſerit, ſequenti die balneum ingrediatur, & poſtero die iterum eas bibat; idem faciendo alternatim per duos menſes integros. Etenim tam in his quam in aliis cujuſcumque demum generis ſint, hoc ſeduló notandum, quod in earum uſu eouſque ægro perſiſtendum, donec non tantum levamen aliquale ſentiat ſed quominus ſymptomata omnia brevi poſtliminio revertant, donec omnino convaleſcat. *Sydenham. Diſſ. Epiſtolar.—de chloroſi loquens.*

'Tis great pity that the latter part of the excellent advice here delivered was not more generally attended to in all complaints for which theſe waters are adviſed.

order which is attended with a ſuppreſſion or diminution of the menſtrual diſcharge.

On the ſame account the warm baths are of the greateſt ſervice in cachectic diſorders, which in many reſpects reſemble the foregoing. This diſorder at its beginning is almoſt always attended with a ſlow pulſe, and diminution of natural heat and ſtrength, and on theſe accounts I think the baths here, as being more ſtimulant, preferable to common water. In cachexy.

Hoffman, who was a great friend to the uſe of the warm bath in this complaint, has here directed a medicated bath prepared from aromatic herbs, evidently to increaſe its ſtimulus, and further the ſame intention of cure with which the Bath waters are recommended.

The good effects of the Bath waters in the jaundice, both internally taken and externally applied, have been long obſerved. This diſorder, as well as the foregoing, is attended with ſymptoms that indicate the uſe of ſtimulant medicines, and in this reſpect the Bath waters ſeem to have a degree of ſpecific action upon the nerves, and perhaps on the bile itſelf, removing that In the jaundice.

torpor, insensibility, and languor, which accompany this complaint, sooner than any other medicines known. Cælius Aurelianus * advises the use of stimulant substances, and such as cause an itching of the skin, to be rubbed or sprinkled on the body after bathing; and directs the water to be made hotter than usual, to render the stimulus the greater. This seems to bear some analogy to the intention with which the baths of this place are recommended.†

In the hypochondriasis.

The hypochondriac disease is likewise greatly relieved by the use of the baths at this place; and, I imagine, in a great degree owing to their stimulus. But as this complaint is of the spasmodic kind, the effects of the waters in it will be more properly treated of under the head of their antispasmodic qualities.

In sterility.

The effects of the Bath waters thus applied in cases of sterility, are too well known to be necessary to be repeated. I shall only observe, that they are most efficacious

---

* De ictero.

† Celsus evidently advises the warm bath as a stimulating cordial remedy in this disease.

cacious in cases where the want of issue is owing to weakness and languor, and where no feverish or hectical symptoms are to be apprehended.

The effects of the Bath waters thus employed are much more extensive as antispasmodic remedies.

Bath waters, externally applied, as antispasmodic.

One of the most remarkable instances of their efficacy in this way is the colica pictonum, in which complaint their use has been long celebrated. Notwithstanding the various causes that have been assigned for this complaint, I am inclined to believe, with Dr. Baker, that it always proceeds from lead, and from that only. The colic is the previous symptom to the palsy, which always succeeds, first of the hands, and then of the lower extremities, if the disease be suffered to proceed. The ingenious writer, last mentioned, has related in his account of this disorder, that the Bath water has frequently succeeded when the other most approved remedies had failed in the advanced state of this complaint. But at the beginning the Bath waters, internally and externally used, prove a speedy and almost certain cure. The use of

In the colica pictonum.

of the warm bath, and of sulphureous waters especially, has been much recommended in this disorder. Even Dr. Mead,* who was so great an enemy to the use of the warm bath in palsy, admits its superior efficacy in this disorder, which is certainly nearly connected with it. Sulphureous waters are likewise advised by Sauvage, both hot and cold, and the former externally as well as internally. Tronchin likewise, the celebrated author of the treatise on this disorder, has advised their use in the strongest terms, as the most effectual remedies in this complaint.†

Hysteric colic.

The hysteric colic likewise has been greatly relieved by the external use of the Bath waters, and probably owing to this quality.

Asthma.

Asthmatic disorders likewise, of the convulsive kind, have been greatly relieved by bathing

---

* Longe autem plus juvat balneo tepido corpus totum immergere. *Mead. monita & precepta medica.*

† Curationem absolvunt sulphure divites thermæ omni medicamine præstantiores. *Tronchin,* cap. xxvii.

Vide also Forestus on the effects of the Aix-la-Chapelle waters in this disorder. *Observ. ac curat. medic.* lib. 21, obs. 15.

bathing in theſe waters. They ſeem particularly ſuited to thoſe ſpecies which affect hypochondriacal or hyſterical conſtitutions, and are exaſperated by the retention of ſome accuſtomed diſcharge, as by the menſes, hæmorrhoidal veſſels, &c.

The Bath waters thus uſed are alſo extremely well adapted to the aſthma, which often ſucceeds fits of the gout that have been repelled from the extremities, and partakes greatly, as Sauvage obſerves, of the nature of the convulſive or ſpaſmodic aſthma.*

They are likewiſe extremely efficacious in the cure of the aſthma from metallic ſubſtances, *lead* eſpecially, which is indeed only a ſymptom of the metallic colic, of which I have before ſpoken.

I have before mentioned the Bath waters as ſerviceable in icterical complaints, by their ſtimulus, as thereby relieving the inertia and languor, which are ſymptoms of this diſorder. But the Bath waters are In jaundice.

* Sauvage adviſes the uſe of ſulphureous baths in this ſpecies of aſthma.

of much more consequence considered in another light, viz. as antispasmodic remedies. The jaundice most frequently proceeds from obstruction of the gall ducts by biliary calculi, and sometimes, though more rarely, to a spasmodic constriction of those passages. The antispasmodic qualities of the Bath waters are of the utmost service, which soever of these causes produce the disease. In the first, by their relaxing quality, they enlarge the diameter of the duct, and procure an easy passage for the biliary concretions; and in the last, by their antispasmodic power, they take off the contraction; in both cases opening a passage for the bile by its proper exit, and thus curing the disorder.

Sauvage was so sensible of the utility of the warm bath in this disorder, that he not only directs it to be used repeatedly, but likewise directs * the purgative medicines to be taken by the patient whilst in the bath, in order that the biliary calculi may pass while he remains in it. But the Bath waters

---

* Æger in ipso balneo catharticum bibat ut calculus in ipso balneo foras elimineutur. *Sauv. nosol. meth. genus, hepatalgia.*

waters are in this reſpect preferable * to a bath of common water, as being more antiſpaſmodic, and poſſeſſing at the ſame time a gentle ſtimulus, which I have before mentioned, as ſo conducive to relieve the ſymptoms of this complaint.

Menſtrual obſtructions likewiſe, when proceeding from ſpaſm, as frequently is the caſe when they are brought on by ſome ſudden and evident cauſe, as affections of the mind, cold, &c. receive the greateſt benefit from the external uſe of the Bath waters, as I have more than once experienced. Menſtrual Obſtructions.

The well-known effects of bathing in the Bath waters in preventing miſcarriage, are, I think, very probably owing to this quality. They ſeem to ſucceed beſt when this misfortune is likely to ariſe from an over ſenſibility of the nervous ſyſtem, and at particular periods of pregnancy, as is frequently the caſe in delicate habits and conſtitutions. Preventing abortion.

The Bath waters likewiſe are of the utmoſt ſervice in ſeveral diſorders which Nervous diſeaſes.

 are

* Baccius adviſes temperately warm baths of ſulphureous waters in this diſorder. De Thermis, p. 112.

are more obviously of the nervous or spasmodic kind, than those just mentioned.

Of this kind are epileptic complaints, St. Vitus' dance, and the hysteric disease,* and other anomalous spasmodic affections. Dr. Charlton mentions in St. Vitus' dance, that six out of eight patients in the hospital were cured or greatly relieved; and that of others who laboured under various other anomalous nervous affections, out of 146, 113 were either cured or greatly relieved, eighteen were no better, five died, seven were improper, and three discharged at their own request. It is obvious how favourable this account is to the good effects of the Bath waters in disorders of this kind, and proves beyond a doubt that the opinion of some of the modern practitioners, as to the bad effects or inefficacy of the Bath waters in such diseases, was ill founded. I shall only observe further, that their good effects here are consonant to what might be expected from their sensible qualities, and the analogy of their known success

* Of each of these I have myself seen several instances.

ſucceſs in other diſorders of the ſpaſmodic kind.*

Nearly connected with the foregoing is the hypochondriac diſeaſe, for the relief of which the Bath waters have been long celebrated. Of late years bathing has been but little adviſed in this diſorder, and the internal uſe of the waters has been chiefly depended on. But it appears from the ancient accounts that theſe waters were celebrated for the cure of this diſorder, at a time when drinking the waters was ſcarce ever adviſed, and the whole ſtreſs laid on their external uſe. Sulphureous baths are adviſed for this diſorder by many of the moſt celebrated phyſicians, both ancient and modern. Hoffman, indeed, prefers a bath of ſimple water to any mineral one; but his ſentiments on this ſubject were evidently deduced more from a theory concerning the cauſe of the diſorder than actual experience. He himſelf allows the great utility of ſulphureous baths in this complaint, Hypochondriac diſeaſe.

* A particular caſe of the ſpaſmodic ſort, very extraordinary in its kind, is related by Dr. Charlton, wherein the external application of the Bath water effected a compleat cure when the moſt efficacious internal remedies h d not the leaſt good effect. Vide his Inquiry, p. 53.

complaint,* notwithſtanding his being an enemy to the uſe of the ſaline mineral waters; but attributes it to nothing more than the greater heat of one of the baths at Toplitz, of the ſulphureous kind, whoſe good effects he inſtances on this occaſion. But juſt after, he adviſes a tepid bath only, in ſuch caſes, as preferable to a hotter one; and evidently ſpeaks of an artificial bath, as a ſubſtitute only when the natural ones cannot be had.†

Aretæus, whoſe judgment and accuracy of obſervation are remarkable, adviſes a ſulphureous bath on ſuch occaſions, and expreſsly with an intention to reſtore the fleſh and ſtrength of the patient; which ſhews how different the opinion of this great writer, concerning the effects of this remedy,

---

* Utiliſſimum autem eſt hypochondriacis balneum Tœplicenſe ſulphuratum, *das Schwefel bad*, non aliam ob rationem quam quod majori caloris temperie gaudeat quam illud quod in urbe eſt.

† Si vero non eſt copia hujus balnei quod a ſulphure nomen habet, utendum eſt eo quod intra urbem eſt ut in labro ligneo ovali circulo fabricato intra conclave balneo quis utatur; *ita enim temperatiori reddito calore, major utilitas in hoc affectu exſpectanda eſt.*—Hic vero notandum, quod, ſi thermæ naturales haberi nequeant harum loco commodiſſime balneum ex ſubtili & levi aqua pluviali præſertim poſt cadentes imbres excepta ſubſtitui poſſit. *Hoffman, de balneor. aquæ dulc. uſu.*

medy, was from ſome modern practitioners, who are afraid of uſing it, leſt it ſhould produce the very complaints which he employs it to remove.*

I have likewiſe ſeen bathing in the Bath waters of the greateſt ſervice in the nervous head-ach, eſpecially that kind called the hemicrania, where half the head only is affected. Two caſes of this kind have fallen under my obſervation, in both of which the return of the complaint was periodical, one of them returning at an interval of about ten days, but rather irregular, the other nearly regular at the end of fourteen days. In both of theſe, the moſt celebrated antiſpaſmodic medicines had been previouſly tried, as muſk, opium, and volatile ſalts, but

Nervous head-ach.

* Cæterum ab his laboribus ad refectionem veniendum eſt; in quibuſdam enim procedente curatione morbus quidem de ſede ſuâ labefactatus eſt. Verum ubi homo ad carnem vireſque jam inſtaurandas pervenit, mali omnia ſimul obliterata ſunt veſtigia, ſiquidem naturæ robur ſanitatem, imbecillitas autem morbos facit. Ad refectionem itaque ſe convertat æger, in naturalibus aquis calidis ſæpe commorans: etenim ea quæ his inſunt medicamenta juvant, ut bitumen, aut ſulphur, aut alumen, quæque in iis reperiuntur aliæ plurimæ facultates; ſiquidem humiditas poſt morbi ariditatem & medelæ vexationem convenit, raræ vero molleſque carnes ad morbi depulſionem maxime conducunt, verum iſtæ in melancholicis aridæ ſunt & denſæ. *Aretæus curatio melancholiæ.*

but without any great preſent relief, and without the leaſt effect in preventing or retarding the return of the paroxyſm. Peruvian bark likewiſe was adminiſtered in large quantity, under the notion of the diſorder's being of the nature of an intermittent fever, but without effect. Indeed the pulſe at this time was low, and rather ſlower than ordinary, and the vital heat, eſpecially in the extremities, diminiſhed. A courſe of warm bathing at this place totally cured both theſe complaints, altho' in one of them the warm bath of common water had been tried with very little relief.

Spaſmodic vomiting.

There is likewiſe a diſorder to which the fair ſex are moſt liable, viz. a ſpontaneous violent rejection of the food from the ſtomach without any previous ſickneſs, which comes on at various times after eating, ſometimes almoſt immediately, and at others at the diſtance of one, two, three, and four hours. This complaint is generally periodical in the ſame perſon, and appears evidently to be of the ſpaſmodic or convulſive kind. In this I have ſeveral times ſeen the external as well as the internal uſe of the Bath waters of the greateſt

ſervice,

ſervice, and in general to work a perfect cure.

The nervous atrophy likewiſe is probably a diſorder of the ſpaſmodic kind, which affects the lacteal and lymphatic ſyſtem. In this I can ſay from experience, as well as the teſtimony of others, that warm bathing in theſe waters is often of the greateſt ſervice. A great preſumption of their good effects in this diſorder may be drawn from the well-known fact, that the women who attend the bath as guides to the bathers, and remain ſeveral hours in a day in the water, and this moſt days in the week for a great part of the year, are in general remarkably luſty and corpulent, notwithſtanding the large evacuation they daily undergo by perſpiration. This coincides with the obſervation before quoted from Proſper Alpinus,* and confirms the hypotheſis of the effect of the warm bath in increaſing the abſorption of the nutritive parts of our food. Nervous atrophy.

Rigidity of the limbs, owing to contractions of the muſcles, (which is undoubtedly Muſcular contractions.

* Page 45.

doubtedly a ſpaſmodic complaint, though not of the nature of thoſe commonly accounted ſo) is generally greatly relieved by the external uſe of the Bath waters. They are adviſed in almoſt all the ſpecies of this diſorder; but there are, notwithſtanding, ſome to which they are more peculiarly adapted. Thus they are of the utmoſt ſervice in thoſe contractions of the muſcles of the extremities, which are often attended with contortion of the limb or joint, and follow fits of the gout or rheumatiſm. Theſe are ſometimes attended with conſiderable pain, but more commonly with a degree of ſtupor and weakneſs of the part. In both theſe caſes the baths at this place are very ſucceſsful, and in conſtant uſe.

Sauvage, in his account of this complaint, recommends the uſe of native ſulphureous warm baths,* as thoſe of St. Laurent, Lamalou, and Bagnau, which are of that kind.

I am likewiſe greatly inclined to believe that they might be very ſucceſsful, thus applied,

* Hæc ſpecies (contractura dolorifica) exigit fotus ex aquis thermalibus ſulphueris, ut Lamalou juxta Biterras; St. Laurent apud Helvios, et Bagnau juxta Mimatem. *Sauvage, genus contractura.*

applied, in thoſe violent contractions of the limbs, and ſometimes of the muſcles of the whole body, and which are attended ſometimes with pain and ſwelling of the joints, and are the conſequence of a high degree of ſcurvy. Theſe remain ſometimes a long time after the other ſymptoms have ceaſed, and are very troubleſome. For theſe Dr. Lind adviſes a courſe of diaphoretic remedies; but at the ſame time takes notice of the great ſervice that was done by the uſe of moderately ſtimulating external applications, applied in the way of fomentation.*

Now I ſhould imagine the Bath waters would fulfil both of theſe intentions, viz. of increaſing the diaphoretic ſecretion, and ſtimulating the part moderately at the ſame time, and on that account be more likely to ſucceed than when either of them ſeparately were purſued.

Paralytic contractions of the extremities, the upper eſpecially, as the hands, fingers, &c. ſometimes follow violent fits of the rheumatiſm, and are generally eſteemed very

* Treatiſe on the Scurvy, p. 212.

very difficult to cure, if not quite incurable.* Yet this complaint, it is well known, generally yields, without any remarkable difficulty, to the external uſe of theſe waters. Of this kind, I believe, are thoſe contractions which are cauſed by wounds, falls, and other external accidents; the ſucceſs of the Bath waters in which has been remarked from great antiquity. The Aix-la-Chapelle waters,† which in a great meaſure reſemble thoſe of Bath, were found of the greateſt ſervice to the military, who received wounds in the wars in Germany and Flanders, and were, in conſequence thereof, afflicted with this complaint.

Of a ſimilar nature to the foregoing are thoſe muſcular contractions that are the conſequences of the colic of Poictiers.

In this complaint the muſcles of the upper and lower extremities are often contracted in ſuch a manner as to feel of an almoſt ſtony hardneſs, eſpecially the calves of the legs, and thighs. Lead is, I believe,

---

* Sauvage ſpeaks of this ſpecies as incurable. Vide his remark on it. Contractura paralytica.

† Vide Dr. Williams on the Aix-la-Chapelle waters, p. 116, 117, 118, and caſes xviii. xxi.

lieve, always the foundation of this diſorder, which indeed is only a ſymptom of the colic of Poictiers; of the good effects of warm bathing in which I have before ſpoken.

I ſhall only obſerve here, that the diſeaſe which appears in Auſtria, deſcribed by Van Swieten * and Mr. Sauvage, and called by the latter *Contractura Bohemica*, and by them aſcribed to the drinking of wine made of auſtere and unripe grapes, may, with much greater probability, be imputed to the effects of the laſt-mentioned metal.

Sauvage mentions warm ſulphureous baths as the principal remedies in this diſeaſe, as well as that which he holds to be more immediately produced by lead.

Bath waters, if proper in fevers.

In the former part of this work I have attributed the good effect of the warm bath in fevers principally to its antiſpaſmodic quality. As I have repreſented the Bath waters as poſſeſſing this in a higher degree than common water, it might perhaps be hence

* §. 1051.

hence inferred that I advifed their ufe as baths, preferably to thofe of fimple water, in fuch diforders. But this is what I by no means defire to be underftood to mean, and on this head I beg leave to offer a few words on the fubject of fpafmodic diforders in general.——

An increafed irritability, which is the general caufe of the diforders called by this name, may be produced by different and even oppofite means. Thus inflammatory fevers, in which the vis vitæ is præternaturally increafed, are often attended with great irritability, and in this cafe thofe applications which diminifh the vital powers, as bleeding and other evacuations, prove antifpafmodic. On the other hand, a great diminution of the ftrength and tone of the fyftem will produce the fame effect, viz. a morbid degree of irritability, to remove which, cordial and ftimulating remedies are indicated, and evacuations are hurtful. Fevers indeed fometimes require medicines of the kind laft mentioned. But this is generally in their advanced ftate, when the inflammatory diathefis has ceafed, or is greatly abated, and the vital powers are much depreffed.

At this period the irritability and diſpoſition to ſpaſm which remains, is frequently owing in a great meaſure to weakneſs. But although the indication be of this kind, it is well known that all the medicines commonly uſed with ſuch intention are not equally proper, but that, on the contrary, great delicacy in their choice is neceſſary. The head is at that time for the moſt part affected with a degree of delirium, which renders great caution in the uſe of ſtimulating remedies very neceſſary. In relieving this laſt ſymptom, the warm bath has generally the moſt happy effects, being, as has been before obſerved, mildly cordial without inflaming, gently filling the blood veſſels without loading the ſtomach, and, what is perhaps its moſt valuable quality, inducing a pleaſing ſenſation on the nervous ſyſtem without the inflammatory qualities of opiates, &c. and at the ſame time entirely under our command, as to the continuation of its effects on the body. But I am greatly inclined to believe, that the above account of the good effects of this remedy in ſuch circumſtances would not be applicable to the Bath waters, which, as I have before mentioned,

act,

act, not only by their general qualities as warm baths, but alſo by their ſpecific ones derived from the nature of their compoſition. What leads me to be of this opinion is, that the Bath waters are not only more ſtimulant than common water, but that their ſtimulus is more permanent, and (to thoſe who have any diſpoſition to feveriſh complaints) of an inflammatory kind. This is obvious from their effects internally taken in the hectic fever, in pthiſes, and ſeveral other diſorders; and it appears highly probable, that the water exerts the ſame effects externally applied, not only from reaſoning drawn from its being abſorbed, and thus acting on the ſyſtem by its peculiar qualities, but alſo from fact: for inſtance, its ſuperior efficacy in palſies and ſuch complaints to common water, in which an inflammatory ſtimulus is of the greateſt ſervice. But the Bath waters are not only more inflammatory than common water, but alſo particularly affect the head, as is well known to moſt of thoſe who uſe them internally, eſpecially at their firſt trial, which is an additional reaſon againſt their uſe in ſuch circumſtances. I have made choice of the above

above ſtate of a fever, as being one where the Bath waters might have the faireſt chance of ſucceſs, the indication being, in ſome degree, of that kind. But if their uſe be improper here, it follows more ſtrongly that they would be ſo in other ſtates of it, wherein the inflammatory diſpoſition was more prevalent, and conſequently their ſtimulant qualities likely to be more dangerous.

In local inflammations.

What has been ſaid concerning the effect of the Bath waters in fevers, is applicable to them likewiſe when attended with any local inflammation, as of the bowels, ſtomach, or any other of the viſcera, or parts immediately neceſſary to life, the brain particularly, as in phrenetic diſorders, their uſe in which I apprehend would be extremely dangerous.

Two complaints are exceptions to this rule, viz. the gout and rheumatiſm; but even in theſe the Bath waters are ſcarce ever adviſed externally while any conſiderable inflammation remains; and the exciting an inflammation in a moderate degree ſeems in the former to be only following the intention of nature, which takes this

method to difcharge the gouty matter; and in the latter as often ufeful in obviating that inertia which I have before mentioned to be of the paralytic kind, which fits of the rheumatifm often leave behind. But of the ufe of the Bath waters in thefe complaints, I fhall fpeak more particularly in another place.

But though I do not think the Bath waters fafe or proper to be ufed externally in continued fevers, I am inclined to think, both from reafon and experience, that they may be of great fervice in intermittents.

The ufe of the common warm bath in thefe diforders has been before fpoken of; and the Bath waters anfwer the fame intentions in a more efficacious manner, as poffeffing greater ftimulating and corroborant powers, and confequently more likely to prevent the return of the paroxyfms, whofe recurrence is probably owing to, or at leaft nearly connected with weaknefs and want of tone of the fyftem. The warm bath was employed* in

* Vide p. 46 of this volume.

in this diſorder, either in the interval, or immediately on its acceſs; but I would prefer the former, when the Bath waters are uſed, on account of their ſuperior ſtimulus, which might rather tend to increaſe the fever if uſed after the fit had begun. But the nearer the time of its acceſs, the more likely to be efficacious, (as is obſerved of all the remedies for this diſorder) provided the paroxyſm had not made its appearance. I would eſpecially recommend this remedy in thoſe intermittents which are of long ſtanding, and attended with obſtructions in ſome of the viſcera, the liver particularly, which often ſucceed this complaint, and are often ſenſible to the touch by a hardneſs under the ribs on the right ſide of the fore part of the abdomen, which is called by the common people the ague cake.

I ſhall next treat of thoſe complaints wherein the Bath waters are ſerviceable by means of their diaphoretic qualities.

Bath waters externally applied as diaphoretics.

Theſe ſeem to be the foundation of the uſe of the waters in rheumatic complaints, in which they have been ſo much celebrated.

In rheumatiſm.

As I have before declared it to be my opinion, that the Bath waters thus uſed are leſs powerful than common water in promoting perſpiration, it might be imagined that I thought them to be leſs efficacious in this diſorder; but this requires ſome explanation.

In the acute rheumatiſm, ſuch as is deſcribed by Sydenham, which is attended with a conſiderable degree of fever, great pain, and other ſigns of an inflammatory diſpoſition,* the common warm bath is preferable to the Bath waters, for the reaſons before given; and even this ſhould be uſed with great caution. But there are many ſpecies of this diſeaſe, where the inflammatory diſpoſition is very ſlight; yet the pain and other ſymptoms very grievous, and of long duration.

Of this kind is that ſpecies which is moſt frequent, and well known by the name of the common rheumatiſm. In this the Bath waters are ſingularly ſerviceable, eſpecially towards the decline of the paroxyſm,

* Hæc ſpecies eſt veré inflammatoria. *Sauvage. Rheumatiſmus acutus.*

paroxyſm, when other ſtimulant remedies likewiſe are obſerved to be of uſe; and from this combination of effects in theſe baths, I imagine, ariſes their ſuperior efficacy. Sulphureous baths are, I ſee, recommended by Mr. Sauvage in one ſpecies, (*rheumatiſmus calidus*) which does not appear to differ eſſentially from the common one.

The Bath waters thus applied are likewiſe of the utmoſt efficacy in thoſe rheumatic pains which ſometimes accompany the colica pictonum, and are generally extremely violent. The reaſon of the ſuperior efficacy of the Bath waters here will eaſily be underſtood from what has been before ſaid of their uſe in the original diſorder, eſpecially when we conſider that this complaint is attended with a degree of palſy of the parts affected.*

Under this head I have choſen to place the gout; though, undoubtedly, the diaphoretic quality of the baths at this place is not the only one by which they prove ſerviceable, In the gout.

* Incipit illa ſpecies a manuum & brachiorum ſtupore formicatione digitorum contractione.

Sauvage. Rheumatiſmus metallicus.

ſerviceable in this diſorder. I believe it may be ſaid, with the greateſt probability, that warm bathing in theſe waters is uſeful in every variety (for I think the beſt writers allow but one ſpecies) of this complaint. Notwithſtanding there are undoubtedly ſome to which they are more peculiarly ſuited.

Thus they are well ſuited to that called by Mr. Sauvage the winter gout,* which is indeed the moſt common of any. It generally comes on in the decline of life, and does not keep regular periods, but recurs throughout the whole year, excepting the three ſummer months. This is the kind of gout ſo incomparably deſcribed by Sydenham, under the title of the irregugular gout, under which he himſelf ſeems to have laboured. Moderately warm diaphoretic remedies are found to ſucceed beſt in ſuch caſes, by the teſtimony of the beſt practitioners.† Sydenham, indeed, objects againſt attempting to carry off the gouty matter by perſpiration, as well as by the other

* *Arthritis hyemalis.*

† In illa conveniunt magis ſudorifica. *Sauvage.*
Sudorifera ex arte inſtituta plus proficere. *Boerhaave,* aph. 1272.

other modes of evacuation; but I am well ſatisfied he meant here only to except againſt the means of promoting that diſcharge which were in uſe at his time, (ſuch as great heat by fires and bed cloaths, and heating ſtimulant medicines) and not to find fault with a moderate and mild diaphoretic regimen. This is evident from the ſubſtances which he adviſes, ſuch as horſe-radiſh, ſcurvy-graſs, theriaca, &c. which are all of this tendency. Had this excellent and candid writer been ſufficiently acquainted with the virtues of the Bath waters, both internally and externally uſed in this complaint, I doubt not he would have recommended them prior to all other remedies, as fulfilling the intentions of cure in a more ſpeedy, ſafe, and efficacious manner.

In the regular gout, the proper time for bathing is generally held to be in the intervals of the paroxyſms; but in this, leſs caution of that kind is neceſſary, and bathing may be uſed with ſafety and propriety as ſoon as the inflammation has abated, and the fit continued for a longer time than the regular paroxyſm. It is obſervable, that this kind of gout is attended

tended with much leſs inflammation and fever than a regular one.

The bath waters are alſo extremely ſerviceable when uſed in this manner in the rheumatic gout,* which is indeed of a middle nature between the two diſorders. This ſeems much to reſemble the third ſort of gout, deſcribed by Dr. Oliver in his Eſſay † on the uſe and abuſe of warm bathing in gouty caſes, in which he adviſes the free uſe of the waters in all their modes of external application.

Sauvage likewiſe adviſes the uſe of warm ſulphureous baths, ſuch as thoſe of Bareges, Lamalou, Rennes juxta Aleth, &c.

The Bath waters are likewiſe of the utmoſt ſervice in the gouty complaints that ſometimes follow the colic of Poictiers, which have been obſerved and deſcribed by Dr. Muſgrave, and ſince his time by Dr. Huxham. The uſe of the Bath waters

* Rheumatiſmus arthriticus. *Sauvage.*

Ille eſt qui & articulos & paſſim partes carneas afficit ita conſtanter ut ad rheumatiſmum & arthritidem fere æqualiter inclinet. *Sauvage. Deſcriptio rheumatiſmi arthritici.*

† Page 53.

ters in the original diſorder, from which this is derived, is an additional reaſon for our judgment in their favour in the preſent inſtance.*

Gouty complaints, when complicated with other diſorders, often receive the greateſt benefit from bathing in theſe waters. Of this kind is the combination of the gout, with the chloroſis mentioned by Muſgrave,† which generally attacks thoſe females who have an hereditary claim to the diſeaſe, and labour under a ſuppreſſion of the natural diſcharges, which probably is the reaſon of its being thus prematurely brought on. The propriety of the uſe of the Bath waters in this manner is very evident, from their being ſo well ſuited to the original diſorder, and particularly to the removal of that circumſtance on which the gouty complaint probably depends.

Another combination of the gout, which is far from uncommon, is with an hypochondriac

* Huxham, I think, adviſes the Bath waters here externally uſed.

Aquæ thermales ſulphurea ſuadentur. *Sauvage.*

† Arthritis ex chloroſi vel arthritis alba Muſgravii.

chondriac conſtitution. In this the Bath waters are ſingularly ſerviceable, both internally and externally adminiſtered. Their uſe in both theſe complaints may furniſh a rational preſumption of the propriety of their trial in circumſtances when they are conjoined; and this is confirmed by full and repeated experience. Dr. Muſgrave* paſſes the higheſt encomiums on their uſe in this kind of gout, which he ſeems to aſcribe to their diuretic quality; though I ſhould be rather inclined to impute it to their ſtimulant or antiſpaſmodic one.

I am likewiſe inclined to think the Bath waters, externally applied, likely to prove very ſerviceable in the ſcorbutic gout, as it is called, when conjoined with a conſiderable degree of the ſcurvy, as ſometimes happens. Dr. Muſgrave,† who has deſcribed this diſorder the moſt accurately of any

* Sed nec aquarum diureticarum vim (quales ſunt Bathonienſes, Aſtropenſes, Bamptonenſes, aliæque permultæ) adverſus hunc affectum, ſatis prædicare valeo; vel uti decet, laudem illis deferre. Coctionem illæ conciliant, digeſtionem illæ confirmant: Illæ ſanguinem expurgant: Illæ ſpiritus permulcent: Illæ melancholicis, & hyſtericis, ſolatio: Illæ arthriticis incolumitati. *Muſgrave, de arthritide melancholica.*

† Externé vero balneo, fotu, illorum ferociam temperanti. *Muſgrave, de arthritide fixa ſcorbutica.*

any perſon, recommends in it the warm bath, and fomentations, to moderate (as he ſays) the acrimony of the humours. Whether the good effects of this remedy were produced by that means, I ſhall not determine; but only obſerve, that the good conſequences of its uſe in the ſcurvy are well known as a fact, and that there is the greateſt probability, from reaſon as well as experience, of its good effect in the diſorders when united.

Bathing in the Bath waters is here peculiarly ſerviceable, and, in my opinion, ſuperior much in efficacy to common water, as being leſs relaxing, and not ſo liable to promote a putrid tendency, and at the ſame time gently diaphoretic and diuretic, which are the moſt favourable means of any of evacuation in this diſeaſe.

The ſame caution, however, is requiſite, as has been before obſerved of the uſe of the warm bath in the ſcurvy, viz. not to employ it if the putrid diſpoſition ſhould be ſo ſtrong as to form external ulcers.

I ſhould likewiſe imagine the Bath waters uſed thus, likely to be of great ſervice

vice in that kind of gout which ſometimes ſucceeds a venereal complaint, as deſcribed by Dr. Muſgrave. That excellent author has adviſed the Bath waters internally, and I think their external uſe promiſes to be at leaſt equally advantageous, on account of the efficacy of the warm bath in eradicating the remains of the diſtemper that gave riſe to it, as well as uſeful in the gout, conſidered as a ſimple diſorder.

Such are the principal caſes of the gout, wherein the Bath waters, uſed as baths, appear to be peculiarly indicated. I do not mean to deny that they may be of the utmoſt ſervice in ſeveral more; but the above I take to be the principal, and to which nearly all the caſes of the gout, that are likely to receive benefit from the uſe of the waters, are in ſome degree reducible. To ſpecify theſe particularly, would exceed the limits of a work of this kind. I take the opportunity of mentioning here, that this diſorder is not ſtrictly ranged under the indication, as there is no doubt that the ſtimulant and antiſpaſmodic qualities of the Bath waters are of great efficacy in the relief of this diſorder, as well as their diaphoretic ones; but as the

the warm baths are uſed in the decline of the diſtemper, and the method by which they ſeem to act in evacuating the gouty matter being by perſpiration, I thought it better to claſs it here as operating by a ſenſible effect, than under others which are more theoretical or uncertain.

The ſame quality of the Bath waters renders them a probable remedy in the ſcurvy, for which I ſhould think them better adapted than ſimple water, on account of their having a moderately ſtimulant and antiſpaſmodic quality, joined with their diaphoretic one.* Sauvage† and Dr. Lind ‡ both adviſe a bath of infuſions of aromatic plants, to promote a ſimilar intention. The ſame cautions as to its uſe are full as neceſſary as when ſimple water is employed.§ In the ſcurvy.

It has been a matter of diſpute, if the uſe of the Bath waters externally was admiſſible In the lues venerea.

* Boerhaave and Hoffman both attribute the good effect of the remedies uſed for this diſorder to their diaphoretic qualities.

† Curatio ſcorbuti. Noſolog. Method.

‡ P. 200. Treatiſe on the Scurvy.

§ Vide p. 59.

miſſible in the venereal diſeaſe. This queſtion has been very judiciouſly treated by Dr. Oliver, ſenior, of this place, who gives the beſt teſtimony of their being highly ſerviceable and ſafe in this diſtemper, both from the accounts of other writers, and his own experience.

In the colic.

The Bath waters, by this quality among others, are of the greateſt ſervice in many colicky complaints, eſpecially thoſe which are induced by change from a hot to a cold climate, which are generally of the chronic kind, and often attended with ſpaſmodic ſymptoms, and not infrequently with a bilious appearance on the ſkin. The gentle ſtimulus they poſſeſs, is here peculiarly ſerviceable in obviating that inertia which is ſo frequent in diſorders of a bilious tendency, while the diaphoretic one tends to reſtore that diſcharge whoſe ſuppreſſion gave riſe to the diſorder.

On account of the former of theſe effects, they are much preferable to common water.

In habitual diarrhæa.

The warm baths of this place are likewiſe extremely uſeful in thoſe habitual diarrhæas which ariſe from a check of perſpiration,

perſpiration, and are frequently the conſequence of a change of climate of the kind laſt mentioned.

In the diabetes.

Probably to the ſame cauſe is owing in a great meaſure the efficacy of the waters in the diabetes; though, undoubtedly, their ſtimulant and corroborating qualities are likewiſe of conſiderable ſervice.

In the leproſy.

Whether the peculiar efficacy of theſe waters externally applied in the leproſy, be owing to this quality, is not quite clear. The fact, however, is well aſcertained by long experience, both ancient and modern; the former eſpecially, when the leproſy was much more frequent than at preſent. The diſorder called the lepra Græcorum is, I believe, what we now call the leproſy in this country; and in this the external uſe of the Bath waters has been long celebrated. I ſhould think likewiſe, that they might be of great ſervice in another diſeaſe of a ſimilar kind, rare indeed in this country, but not without inſtances of its being ſeen, I mean the elephantiaſis,* or lepra Arabum.

* The elephantiaſis of Aretæus, Dr. Cullen, and Sauvage, not the elephantiaſis of Rhazes deſcribed by Dr. Hillary

Aretæus has recommended the uſe of the natural warm ſulphureous baths*; and ſulphureous applications externally, are adviſed by Cælius Aurelianus.†

Dr. Hillary likewiſe ſeems to approve of the uſe of ſulphureous medicines in this diſeaſe, which is ſometimes endemic in the Weſt-India iſlands.

In the apthoides chronica.

I muſt not here omit to mention a diſeaſe wherein the Bath waters are recommended by the author laſt named, and which he only, I believe, has deſcribed: This diſeaſe he calls by the name of *apthoides chronica*, or *impetigo primarum viarum*, the former of which names may, I think, be very properly adopted. This diſorder begins with a ſlight burning ſenſation about the pit of the ſtomach, which gradually increaſes, and riſes up into the mouth, when ſmall clear puſtules, filled with acrid pellucid lymph, riſe firſt on the

lary in his account of the diſeaſes of the Weſt-India Iſlands, which is a quite different diſorder, and not at all adapted to the ſame remedies.

* Balnea naturaliter calida ſulphurea proſunt. *Aretæus, curat. elephantiaſis.*

† De Elephantiaſi.

the end and ſides of the tongue, and ſpread over the mouth and downwards thro' the œſophagus, and ſometimes thro' the whole alimentary canal. Theſe puſtules break, and the parts become raw and extremely ſore. In ſome a ſpitting comes on, and in others a vomiting, and afterwards a diarrhæa, which gives ſome preſent relief; but the diſorder generally returns with aggravated ſymptoms, and the patient, for want of ability to take in ſufficient nouriſhment on account of the pain it gives, and of power in the inteſtines, on account of their increaſed ſenſibility, to retain it a ſufficient time to have the nutritive parts abſorbed, dies of an atrophy or maraſmus. No fever, heat, or thirſt, attend this complaint, but the perſpiration* is diminiſhed. The reſtoring the laſt-mentioned evacuation is made one of the firſt and principal indications by the abovementioned excellent practitioner; and to accompliſh this moſt effectually, he recommends warm bathing in ſome of the natural warm baths above all other reme-

* For a more particular account of this diſtemper, vide *Dr. Hillary's Obſervations on the diſeaſes peculiar to the Weſt-India Iſlands*, p. 277, & poſtea.

dies, and what has ſucceeded when all others have failed. Thoſe of the ſulphureous kind, Bath waters eſpecially, he principally adviſes, and mentions ſeveral remarkable cures which were accompliſhed by uſing them as baths.

He endeavoured to imitate them by an artificial ſulphureous and chalybeate impregnation, but with great candour owns, that his ſucceſs was not equal to thoſe who uſed the native ſulphureous waters. He makes here a curious obſervation, that thoſe who bathe in the native warm baths are not ſo ſubject to take cold after bathing as thoſe who bathe in an artificial bath. Whether this be owing to any aſtringent or ſtimulant quality in the native ſprings, which cloſes the pores of the ſkin more than common water, or to the equability of their heat, which is not conſtantly decreaſing, as it is in the artificial hot baths, I ſhall not determine. Either way, as a fact, it is a powerful argument in favour of the natural ones, in preference to their artificial imitations.

Bath waters as diuretic.

The diuretic effects of the Bath waters uſed in this way, though leſs conſiderable, are ſtill worthy notice.

Hepatic

Hepatic obſtructions, commonly called liver complaints, have been long obſerved to be greatly relieved by the uſe of theſe waters. As the diuretic quality they poſſeſs, which is well known to be a very favourable circumſtance in theſe diſorders, is in them in a conſiderably greater degree than in common water, it is not at all improbable, that their ſuperior efficacy may in ſome meaſure be owing to this cauſe. In liver complaints.

The like may be ſaid of eruptions on the ſkin, ſuch as are uſually called ſcorbutic, the leproſy, and other cutaneous affections, in which this diſcharge is much indicated, and the Bath waters peculiarly effectual. In cutaneous diſorders.

By the ſame means Bath waters, uſed externally, are of the greateſt ſervice in calculous diſorders. But I would not here be underſtood to mean thoſe where any large calculus is already formed, but ſuch only wherein there ſeems to be a diſpoſition in the conſtitution to generate ſabulous matter, and where no conſiderable concretion of it has taken place. This ſeems often to happen towards the decline of life, from the ſlowneſs of the urinary In the calculus.

ſecretion, which cauſes it to remain a long time in the bladder before ſufficient be accumulated to urge it to be diſcharged. In ſuch caſes, and indeed in all others of this kind, where diuretic remedies are admiſſible, the Bath waters are of the utmoſt advantage, both externally and internally uſed; diluting the conſiſtence and acrimony of the urine, gently ſtimulating the organs to ſecrete it more plentifully, and thus preventing its too long ſtay in the bladder; and by its antiſpaſmodic quality likewiſe taking off the ſpaſm which frequently happens upon the urinary organs, which prevents its being ſecreted in proper quantity, and cauſes many of the ſaline and earthy particles, which nature intended to throw off by this evacuation, to be retained, as not being capable of paſſing the veſſels when their diameter was contracted.

Bath waters externally uſed as expectorant.

Whether the Bath waters are more efficacious than common water in promoting the diſcharge by expectoration, I have before mentioned is not aſcertained. A priori, we might imagine this to be the caſe, from their poſſeſſing a ſuperior degree of ſtimulus; and I have ſeveral times ſeen them of great

ſervice

ſervice by theſe means in gouty coughs, wherein this diſcharge was of the greateſt advantage; and I have even ſeen the fit entirely carried off by theſe means.

The difference of the Bath waters from common water, with reſpect to the other indications, is too trifling to merit our regard.

Contra Indications of the EXTERNAL USE *of the* BATH WATERS.

What has been before ſaid on this head of common water,* relative to its mechanical action on the ſurface of the body, is in a great meaſure applicable to the Bath waters.

'Tis true, indeed, that their relaxing and ſoftening qualities are not ſo great, owing to the aſtringent ſubſtances which enter into their compoſition; but this difference is too ſmall to make any material alteration in a medical view, and conſequently wherever the warm bath was contra indicated on that account, there the Bath

* Vide page 92.

Bath waters likewiſe are likely to prove detrimental.

It is almoſt unneceſſary to make the ſame obſervation relative to their rarefying qualities; but with reſpect to their ſpecific effects, there is a conſiderable difference.

In fevers. Thus the warm bath is probably, as a ſtimulant, of great ſervice in many fevers, where the ſtrength and ſpirits are greatly depreſſed. But the Bath waters in ſuch caſes, although they poſſeſs a more powerful ſtimulus than common water, are improper, becauſe their ſtimulus is more of an inflammatory nature, which in ſuch caſes would be highly injurious.

In inflammation. The Bath waters, for the ſame reaſon, are dangerous in all fevers attended with local inflammation, as of the lungs, bowels, &c. and particularly of the brain, or its membranes. This holds true of external inflammation likewiſe, as of the opthalmia, and other inflammatory affections* on the ſurface of the body, the eryſipelas particularly, in which their uſe is

---

* Cancerous complaints are obſerved to be aggravated by the Bath waters.

is remarkably improper. The rheumatiſm and gout have been before mentioned as exceptions to this general rule.

The uſe of the warm bath has been very properly condemned in thoſe caſes that are ſubject to hæmorrhagy; and in theſe the Bath waters are ſtill more improper, as poſſeſſing a greater ſtimulus, as well as equal rarefying qualities. This holds true, particularly in conſumptive complaints of the pulmonary kind. In hæmorrhage.

The greater ſtimulus of the Bath waters likewiſe renders them highly improper in immoderate menſtrual evacuations. In immoderate menſtrual diſcharges

What has been obſerved of the impropriety of uſing the warm bath in plethoric habits, is ſtill more neceſſary to be attended to in the uſe of the Bath waters. This holds more ſtrongly if the patient has been ſubject to any of the ſymptoms that uſually precede apoplexy, as vertigo, increaſed ſleepineſs, &c. The neceſſity therefore of a compleat evacuation in ſuch habits, previous to the uſe of the Bath waters as baths, is too obvious to be inſiſted on. In plethora.

The

In diarrhæa.

The uſe of the waters in this manner has been, probably for the ſame reaſon, condemned in the diarrhæa; but unleſs this be attended with fever, or an extreme degree of irritability,* I think the Bath waters, as I have ſeveral times experienced, are ſo far from being dangerous, that they are in general a ſafe and effectual remedy.

In obſtructions of the viſcera.

Bathing in the waters of this place is likewiſe generally forbidden in obſtructions of the bowels, and other abdominal viſcera. On this ſubject I muſt repeat what has been before obſerved in the firſt volume of this work,† that where we are certain any ſuch exiſt, as in the caſe of ſchirrhus, this caution is very proper; but ſcarce any diſorder is oftener imaginary than that of which I am now ſpeaking, and the name is applied to many complaints in which the Bath water, thus uſed, is a ſafe and effectual remedy. What ſeems to come moſt properly under this denomination, that can be judged of by any

* Vide page 60, note.

† Page 369.

any external ſymptoms before it goes ſo far as to form ſchirrus, is the cachexy; and in many of the ſtages and degrees of this diſorder, the Bath waters are perfectly ſafe, and frequently very beneficial.

A tendency to dropſy likewiſe, indicated by œdematous ſwelling of the legs and ancles, is generally thought to contradict the uſe of the warm bath, and with reaſon, on account of the abſorption of fluid to which it gives occaſion. This cauſe might ſeem to hold with equal force againſt the uſe of the Bath waters in a ſimilar manner; yet there are undoubtedly ſeveral caſes of this kind in which bathing in the Bath waters is of the greateſt ſervice, particularly thoſe which ſucceed fits of the gout, and thoſe likewiſe which come on after accidents, as ſprains, &c. The ſtimulus of the Bath waters here evidently counteracts the bad effects of the abſorption of the fluid, by cauſing it to be taken up again by the proper veſſels, and evacuated out of the body by the excretions ſuitable to it. In dropſy.

Warm bathing is generally thought injurious in rupture, or hernia; and this is, I believe, In hernia.

I believe, by many thought to be the caſe with the Bath waters alſo. How far this may be conſonant to general experience, I know not; but from what I have myſelf had an opportunity of obſerving, cannot think it well founded. The common opinion is, that the water, by its relaxing quality, enlarges the aperture thro' which the inteſtine had paſſed, and thus gives opportunity for the protruſion of it in a greater degree. But the Bath waters, I believe, much more commonly prove ſtimulant, and urge the muſcles to contract and exert their tone than relax them. I have ſeen two inſtances of this kind, one an umbilical, and the other an inguinal hernia; the firſt of which diſappeared entirely by bathing in theſe baths, and the other was greatly reduced in ſize.

In extreme weakneſs.

The Bath waters, as well as baths of common water, are likewiſe very properly forbidden in caſes of extreme weakneſs. For although their cordial and ſtrengthening qualities be very conſiderable, yet in order to their ſucceeding properly, ſome degree of ſtrength is neceſſary on the ſide of the patient, otherwiſe they, like other remedies of the ſtimulant kind, rather oppreſs

preſs and load than relieve nature. Hippocrates has made an obſervation,* which I take to be of this kind, and which is applicable in the preſent caſe. This rule is well known to hold good of the cold bath, which, if uſed when the patient is very weak, is apt to increaſe that diſpoſition; but if delayed until ſome ſtrength has been acquired by other means, proves an efficacious remedy in the ſame intention.

But the Bath waters are not only prejudicial in ſuch caſes, by means of their ſtimulus, but likewiſe by the evacuation they produce. Perſons in that ſtate are generally ſubject to have the perſpiratory diſcharge eaſily excited, and often very profuſely. The Bath waters, though perhaps leſs exceptionable on this account than common water, are ſtill ſo much ſo as to render their uſe in ſuch circumſtances improper. The like may alſo be ſaid of all diſorders

* Et calida lavari, donec quidem corpus ſuperat ejus exhibitionem, florere corpus facit. Quum vero ſuperatum fuerit gracile corpus facit. *De locis in homine*, §. liii.

In another place, he expreſsly forbids it to thoſe who are much debilitated. Neque debilitatos lavari oportet, §. xlii. *De victu acutorum*.

diſorders whatever wherein this evacuation is increaſed * to a morbid degree.

OBSERVATIONS *on the Method of* USING *the* BATH WATERS.

As to the choice of the baths.

As to the choice of the baths:—

As relative to their different heats.

This may be conſidered in two lights; one, as to the degree of heat, and the other, as to their ſpecific qualities.

As to the firſt of theſe, I have before mentioned the heat of the different baths as varying about four degrees in their native heat from one another. Thus the King's bath in the hotteſt part is 112 degrees, or nearly ſo, the Croſs bath about 108; and the Queen's bath is much about the ſame heat with the Croſs bath; but as this receives all its water from the King's bath, it cannot be called its native degree of heat. I believe the heat in the King's bath never falls below 105 degrees, nor below 100 in the Queen's and Croſs baths, in

* Dr. Oliver, ſen. mentions violent ſweats as contra indicating bathing in the Bath waters. Vide his Practical Diſſertation on the Bath waters, p. 77.

in the cooleſt parts; but of this I am not certain, as there is a pipe which carries off part of the water as it riſes into the ciſtern, whoſe bore may be occaſionally contract-ed, and thus make it to fill quicker or ſlower, and of conſequence in the former caſe increaſe, and in the latter diminiſh the degree of heat. What difference this may make, according to the quantity let to run to waſte, I cannot ſay; but believe what I have ſet down above to be the general temperature. Such are the degrees of heat of the public baths; but if an inferior degree be deſired, it may be had at the Abbey bath, where there is a very ingenious contrivance for a tepid bath, where the water is ſuffered to cool without expoſure to the air, or loſs of its volatile parts.

When, therefore, the bath is uſed as a ſtimulant, as in paralytic caſes, the hotteſt part of the King's bath, or the Hot bath, is preferable; where as an antiſpaſmodic, as in the tetanus, hypochondriac complaints, and other nervous diſeaſes, the cooler parts of the King's bath, or the Queen's, are more proper; where a mild diaphoreſis

diaphoresis is desired, the Queen's, or Cross baths, or perhaps a still lower degree, are most effectual. No general rules can be laid down that may not be liable to exception; but in the main, I believe, the same directions that have been given with respect to the heat of the warm bath, considered as of common water, will answer with the Bath waters.

As to their specific qualities.

The different specific qualities of the several baths may likewise be here taken into consideration in the regulation of our choice of them. Whether these, exclusive of the effects of the different degrees of heat, vary so much as to make any sensible difference in the effect of the water outwardly applied, I cannot determine from experience, and I am apt to think it not very considerable. But as the peculiar qualities of the waters certainly cause them (when taken internally) to vary from one another in their effects, it may not be improbable that the same holds in some degree of their external aplication. Thus in cases where the stimulant qualities of the waters are wanted, as in the palsy, the King's bath would be most proper; where the sulphureous parts of

of the impregnation ſhould be thought to have any peculiar efficacy, as in ſome cutaneous diſorders, the leproſy* for inſtance, there the Hot bath, as being thought to contain this ingredient in greateſt quantity, would be preferable; and where a leſs ſtimulus was neceſſary, and the urinary diſcharge to be promoted, there the Croſs bath, as being accounted moſt diuretic, might be more adviſeable. But although I mention this more as matter of conjecture than as any certain induction from fact or experience, yet, as the experiment can do no harm, and ſeems conſonant to analogy, I think ſome attention ſhould be given to it.

This, as well as the foregoing, muſt vary conſiderably according to circumſtances. Formerly a longer ſtay in the bath was recommended than is common in modern

Time of ſtay in the bath.

---

* Part of the Hot bath was, until lately, divided from the reſt by a wall, and appropriated to thoſe who belonged to a hoſpital for this complaint, called the Leper's hoſpital, and the bath was called the Leper's bath. Probably this choice of our anceſtors of this ſpring for ſuch a purpoſe was not merely accidental, but aroſe from obſervation of its ſuperior efficacy in that diſorder, which they had much greater opportunity of making than at preſent, as the diſorder was much more common in former ages.

modern practice; at present from ten, or even five minutes to an hour, is the usual extent: But formerly, two, three, and even four hours stay is said to have been, in some cases, advised. The same general rules are here applicable as to common water. Thus if we make use of it as a stimulus, as in the palsy, the common time of stay is from 15 minutes to half an hour; and I have observed, that it may be longer continued in, without losing its stimulant quality, than a bath of simple water, as its stimulus is not only more powerful, but also more permanent. The same rule may be said to hold of other cases, wherein its stimulus is of service, as in some contractions of the limbs, such as often come on at an advanced time of life, which an ingenious writer has thought to proceed from the stagnation of the coagulable lymph, which stops the circulation thro' the vessels already become rigid and unelastic by age, and consequently less able to propel the fluids* through them in the course of circulation.

When

* Vasa rigida, & inde per lympham sanguinis coagulabilem obturantur. A vasis lymphâ obturatis (*contractura*) frequentissime oritur; in senectute quidem, quia hoc vitæ tempore vasorum

When uſed as an antiſpaſmodic, a longer ſtay is in general (as has been before obſerved of a bath of ſimple water) adviſeable. But here we ſhould diſtinguiſh, whether we can properly aſcribe its antiſpaſmodic powers to its ſtimulant or its more properly ſedative qualities. Thus in the palſy, a contraction of the muſcular parts often happens from the weakneſs of the antagoniſt muſcles; and in this caſe the Bath waters act as antiſpaſmodics, by means of their ſtimulant qualities.* The ſame may be ſaid in ſome degree of the hypochondriaſis, which is with moſt probability aſcribed to a defect of irritability of the

 nervous

vaſorum irritabilitas minor eſt. Et ſi motus diminuatur, ut hujus modi exoriretur morbus neceſſe eſt; nam vaſa in ligamentis minutiſſima ipſo motu ſtimulantur & ad contractionem impelluntur. Utile igitur ad vaſorum actionem augendam erit balneum. *Parr's Theſis.*

* The Bath water here cures the contraction by exciting the muſcles which had been weakened, into action, and thus reſtoring the due balance between them and the reſpective muſcles, that ſerve for the contrary motions. Thus in a palſy of the hand, the fingers are generally in a contracted ſtate, or graſped inwards from the loſs of ſtrength in the extenſors, which, if we can reſtore to them, the motion of the hand again becomes perfect. Moſt paralytic limbs are in a contracted ſtate in ſome degree, eſpecially the hand and arm, becauſe the extenſor muſcles being much weaker than the contractors, are generally firſt and moſt powerfully affected.

nervous ſyſtem. But in other caſes, the bath ſeems to act by its more purely ſedative powers. Thus in caſes where the whole ſyſtem is affected, and the nervous influence unequally diſtributed, as in the hyſteric diſeaſe, epilepſy, &c. or where the affection is partial in conſequence of ſome local ſtimulus, as of a ſtone paſſing the ureters, or the gall ducts; in theſe, I ſay, a long ſtay in the bath is neceſſary, which ſometimes (as in caſes of the latter kind) admits of ſcarce any other admeaſurement than by the effect produced. It is proper to obſerve here, that when ſo long a ſtay is thought neceſſary, that the more temperate baths ſhould be employed. When uſed, as they frequently are with a diaphoretic intention, as in the rheumatiſm, a pretty long ſtay is generally thought neceſſary, in order to procure a large evacuation by ſweat. But if it be true, as many of our beſt modern practitioners are of opinion, that the ſame good effects may be produced by a very moderate and inconſiderable degree of this diſcharge, a leſs time will ſuffice, and is much more eligible, as it does not weaken the patient nearly ſo much, and does not expoſe him to ſuch hazard of getting cold afterwards.

afterwards. I believe the ſame will hold good of moſt other complaints, wherein it is thought neceſſary to promote this diſcharge.

If uſed as a diuretic, the ſame rules, as to ſtay in the bath, will ſuit, as are directed in the caſe of ſimple water, ſaving that a leſs time is neceſſary in proportion, as the Bath waters poſſeſs this quality in greater degree than common water.

With reſpect to the other indications, nothing is neceſſary to be ſaid, as they are only of a ſecondary nature, and depend on the foregoing.

If the Bath waters are uſed with a ſtimulant intention, as in palſy, all the means that further this purpoſe are proper to be uſed. Motion of the body, therefore, whilſt in the bath, is very adviſeable, eſpecially of thoſe parts that are principally affected. The common method is to walk about in the bath, ſupported, if neceſſary, by a guide; and this motion is often found much eaſier to perform than could be imagined, by many who uſe this remedy, whoſe weak ſtate would not allow it in

Method of uſing the baths.

any other place or manner. Friction likewise in such cases, whilst in the bath, is very serviceable, especially on the part affected. This is generally performed with brushes, which serve the purpose very well.

The same directions are in a great measure applicable to the baths, when used as antispasmodic remedies, saving that friction is not so necessary, except in some local affections, as contractions of the limbs, &c. and even motion itself should be cautiously used in such disorders as are apt to be excited by it, as some kinds of nervous disorders, spasmodic vomitings, &c. But in general, as much motion in the bath as can be used without fatigue, is proper.

Formerly the practice was, after bathing, to put the patient into a bed, or between blankets, heated to a considerable degree, and often with a fire in the room, in order to encourage profuse sweating;* but of late this method has been disused, and a more moderate one substituted, as it was found that the former was not only dangerous, on account of the heat excited, but

* This practice is very ancient. Vide note, p. 117.

but alſo frequently defeated the very point aimed at, viz. a profuſe perſpiration. It is now found, that when the heat riſes beyond a certain pitch, that this diſcharge ſtops altogether,* and that the beſt means of reſtoring it are by lowering the heat of the body by cool liquors and freſh cool air.† But this diſcharge, even when as large as could be deſired, is not found to anſwer any purpoſe which may not be effected by a ſlight diaphoreſis, and is very inconvenient on other accounts, as being very weakening, ſubjecting the patient to danger of a putrid diſorder by the re-abſorption of his perſpiration in which he lies, as in a bath, and to cold from the exhalation of its moiſture; and moreover rendering a ſubſequent expoſure to the air during the day of bathing much more hazardous than if a more moderate courſe had been purſued. The method at preſent in uſe is, for the perſon who bathes (if it be in the morning) to go to bed for

 a ſhort

* This is only applicable to ſweating in bed, ſince people in a bath, or by great exerciſe, will often ſweat when heated above the degree which ſtops all perſpiration in a bed.

† Vide Alexander's Experiments.

a ſhort time afterwards, rather to compoſe himſelf after the hurry and fatigue of bathing, and to give the body an opportunity of cooling gradually after the great heat to which it had been expoſed, than for the ſake of promoting any evacuation by the ſkin. If the weather be cold, the bed is ſlightly warmed; if moderate, and he go again into the ſame bed in which he had lain during the night, nothing of this kind is neceſſary. No more bed cloaths are laid on the bed than the perſon is accuſtomed to in health; nor is there any fire or other means uſed to make the chamber warmer than uſual. By purſuing this courſe it is found that the bather, if able in other reſpects, may, without any hazard, expoſe himſelf to the air, if moderately warm on the day of bathing, which was formerly ſtrictly forbidden on account of the danger of getting cold, which was owing much more to the injudicious treatment above-mentioned than to any effect neceſſarily attending the uſe of the bath. But though I think the above-mentioned caution concerning going out on the day of bathing carried greatly too far, it is not at all my intention to adviſe a raſh expoſure to the

air

air at all events. The body is always on the days of bathing more ſenſible of cold, and more ſuſceptible of injury from it, than at another time; and therefore this caution, in cold weather, eſpecially if moiſt,* is very proper to be obſerved, as experience ſhews.

Time of day.

The time of day for bathing has in the public baths been by cuſtom immemorial fixed between the hours of five and nine in the morning, as the baths are let off at the hour laſt mentioned. Whether this aroſe from obſervation of their good effects being beſt exerted at this time, or from a motive of convenience to the public or the attendants on the baths, I cannot ſay: But as I think ſome regard ſhould be paid to an old-eſtabliſhed cuſtom, which might have been ſet up for good reaſons, though we are not at preſent acquainted with them; and as many other great writers, Hoffman eſpecially, (who ſeems to be particularly acquainted with the uſe of the warm bath) have concurred in the ſame opinion as to the time of uſing that remedy; and as that

* Moiſt air checks perſpiration more than a clear air of a much cooler temperature.

that time, as I have before obferved, is more likely to favour its operation as a ftimulant, for which it is principally ufed: For thefe reafons, I fay, I cannot help thinking the morning the beft time in general for the ufe of the Bath waters in this way.

But as many cafes may occur where an immediate trial at any hour may be defirable, and others to which the evening may be better fuited, fuch as feveral fpafmodic difeafes of the former kind, and others where its diaphoretic and fedative qualities are indicated, as in the latter cafe, a convenient and elegant bath may be had at any hour at the Abbey baths, filled with frefh water for every feparate perfon who ufes them, of nearly the fame heat and quality with the King's bath water. This is particularly fuited to thofe to whom exercife is recommended, and the feafon of the year too fevere to admit of it on the day of bathing, except ufed before the trial of the bath.

Time of year.

Formerly the ufe of the Bath waters, as well externally as internally, was confined to the fummer months; but for many years paft the colder, or rather more moderate feafons,

ſeaſons, as the ſpring and autumn, have been preferred. But I am apt to think that the reputation of the waters has been no gainer by the change, and that their uſe as baths is likely to be much greater in a warm than a cold, or even a moderate ſeaſon. This obſervation has been made in the firſt volume of this work,* relative to the waters when drank, and is much more applicable to them when uſed as baths, as they act in that form more immediately by thoſe qualities to which warm weather is favourable, and which cold weather counteracts.† That this was the opinion of our anceſtors, the hoſpital in this place, called by the name of Bellott's hoſpital, is a remarkable inſtance. In this there is a proviſion for a certain number of patients whoſe caſes are adapted to the Bath waters, for the ſix ſummer months, but none for the remainder of the year, probably on the ſuppoſition that the ſummer ſeaſon only was ſuited to their uſe.

Modern

---

* Page 411.

† For the time of the year, the Spaniſh and Italian authors prefer the ſpring and fall; but with us I hold the months of May, June, July, and Auguſt to be the beſt.

Jones, Bath of Baths Ayde, publiſhed 1572.

Modern practitioners likewiſe appear to be of the ſame opinion.

Dr. Oliver, ſen. in his Practical Diſſertation on the Bath waters,* ſeems to think that the ſummer is the moſt proper ſeaſon both for bathing and drinking the waters; and Dr. Oliver, jun.† and Dr. Charlton,‡ both profeſs the ſame ſentiments; the latter of which gentlemen has, in his excellent Treatiſe on this ſubject, (in the part quoted) given a very remarkable inſtance of the truth of this poſition, relative to paralytic complaints; and if I may truſt my own experience, I have obſerved the ſame thing in reſpect to other diſorders, eſpecially gout and rheumatiſm, in which the water is thought to be ſerviceable by means of its diaphoretic quality.

How often the uſe of the bath ſhould be repeated, and how long continued.

The frequency of the repetition of the bath, and the length of time which its uſe ſhould be continued, it is evident, are queſtions

* Page 48, 74.

† Page 90. Eſſay on the uſe and abuſe of Warm Bathing in gouty caſes.

‡ Inquiry into the efficacy of warm bathing in paralytic caſes, page 24.

tions which muſt be determined by the nature of the particular caſe, and can only be anſwered in a general manner.

The common practice at this place is to bathe from once to three or four times a week, ſome uſe it every day; but ſo frequent a repetition requires a ſtrong habit and conſtitution, to ſupport ſo large and frequent evacuations by perſpiration, as this practice would be likely to induce. The Ruſſians, indeed, uſe much hotter baths almoſt daily; but this, as I have before obſerved, is a cuſtomary exerciſe with them in health, and not applicable to our climate or conſtitutions. Hippocrates likewiſe, with whoſe countrymen the warm bath was much in uſe, adviſes it every day, and even twice a day; but this, as well as the foregoing, is no rule for us, for the reaſons before given; and beſides, the Greeks did formerly, and the Ruſſians at preſent, take meaſures to prevent the increaſe of perſpiration, which are not in uſe among us; the former, by going into a cold bath after the uſe of the hot one; and the latter, by rubbing the body over with ſnow, which checks that diſcharge,

diſcharge, and of conſequence prevents the weakneſs which its exceſs is apt to occaſion.

Indeed, I believe the Bath waters might be uſed frequently with greater ſafety than a common bath, as they are more ſtimulant, and leſs diaphoretic, and of conſequence do not weaken the body ſo much as a bath of common water.

It is proper to obſerve, that what is here ſaid relative to the frequency of bathing, is only meant to affect chronical complaints, and ſuch as require a long continuance of that remedy.

The time of the baths being continued, as well as the frequency of its being repeated, muſt depend on the nature of the caſe.

In palſy, wherein its principal uſe is probably as a ſtimulant, it is ſometimes employed for a long time together. Dr. Charlton mentions ſeveral who have bathed twice a week for ſix months ſucceſſively, and ſome much longer, and received great benefit. One of theſe found not the leaſt benefit by the waters for three months,

yet

yet recovered perfectly by their longer uſe. And another, where eight months had elapſed with ſcarce any perceptible alteration for the better; yet, by perſiſting in their uſe, a compleat cure was obtained. I have known an inſtance myſelf of this diſorder, where the bath was continued at the rate of twice a week, and often more frequently, for the term of ſeven and eight months, and this repeated every year for three years together, and with a conſtant, and gradual, tho' ſlow amendment. This circumſtance is greatly in favour of the Bath waters, and evinces their ſuperiority over other remedies of the ſtimulant kind, which, though at firſt they appear to be ſerviceable in this diſorder, ſoon loſe their effect by habit. It ought likewiſe to be a caution to thoſe who uſe them for this complaint, not to deſpair of relief from bathing, too early, provided it does not appear to be contra-indicated in other reſpects, ſince it has proved of the greateſt ſervice at ſo late periods. Had thoſe of higher rank who reſort to Bath for this diſorder, been as much under the command of the phyſician as the patients of the hoſpital, I do not doubt many more cures

would

would have been performed than have been; but, unfortunately, this diſorder is too often combined with a fretfulneſs and impatience of temper, which is, indeed, produced by it, and which renders the perſon who labours under this complaint apt to be diſcouraged by the trial of a remedy, ſimple in itſelf, whoſe operation is ſlow, and produces little immediate ſenſible effect of any kind; and though not painful, or very troubleſome, requires ſome confinement and conſtant attention.

Contractions of the limbs likewiſe require very frequently a long uſe of the waters; but in theſe pumping is generally preferred to total immerſion.

Cutaneous diſorders likewiſe, as the leproſy, &c. often require the continuance of the bath for a great length of time to perfect a cure, as four, five, and ſix months, and often a much longer time.

Some caſes of the gouty and rheumatic kind alſo require a long continuance of the uſe of the bath;* but in general from three weeks,

* By the old accounts this ſeems to have been the practice of former phyſicians at this place, when bathing was more in vogue than at preſent. Vide *Pierce and Guidott on the Bath waters.*

weeks, or lefs, to two months together, is the ufual practice in moft of the diforders wherein bathing is recommended.

Regimen of life proper to be obferved during a courfe of bathing in the Bath waters.

As to this article, the directions * before given, relative to the warm bath, are applicable here in general; but more caution is neceffary with refpect to fermented liquors, and high-dreffed food; and this more particularly on the days of bathing, efpecially if the bath be ufed in the evening. This caution muft be underftood only of fuch cafes as ftimulants are likely to prove injurious to, fince in others, as in paralytic cafes, the moderate ufe of fuch things may be of fervice, in coinciding with the effects of the waters.

Attention fhould likewife be paid to the paffions of the mind during the ufe of the waters in this way. Serenity of mind is always favourable to health, and is here efpecially neceffary to be preferved. Hoffman mentions, from his own knowledge, that hectic fevers, and other very dangerous and often incurable diforders, were produced by ufing the hot bath after the mind

* Page 123.

mind had been agitated with rage and anger. This caution, it is obvious, muſt be at leaſt equally applicable to the Bath waters.

Moderate exerciſe during their uſe is always recommended, but with caution, not to carry it ſo far as to overheat or fatigue the body.

Where this cannot be uſed, either from the ſeverity of the weather, or inability of the limbs to perform or endure it, friction is an uſeful ſubſtitute, and ought always to be uſed, when it can conveniently, and conſiſtently with the nature of the complaint.

Moderate laxity of the bowels is alſo full as neceſſary during a courſe of bathing in theſe waters, as in the common warm bath. If the patient be young, and the coſtive habit be attended with inflammatory ſymptoms, ſome of the ſaline purgatives, as Glauber's or Rochelle ſalts, or vitriolate tartar, are proper; but if the contrary be the caſe, the aloetic purgatives, either ſimple, or combined with the gum reſins, as myrrh, or guiacum, are preferable. Formerly, a courſe of evacu-

ation

ation by purging, and ſometimes of vomiting beſides, was almoſt always premiſed previous to the uſe of the Bath waters in nearly all complaints, by way of preparative, as it was called. But of late years this indiſcriminate mode of practice has been, in ſome meaſure, laid aſide; and phyſicians are now in general content to preſcribe ſuch medicines when a neceſſity for their uſe appears from the nature of the diſorder itſelf.

I am far from meaning here to encourage a raſh uſe of ſuch important and active medicines as the Bath waters, but to recommend a method of uſing them upon rational principles, and to avoid that rotin of practice which has prevailed too much in all branches of medicine, and is the natural produce of ignorance and indolence. I am well ſatisfied, many caſes require evacuant medicines previous to the beginning a courſe of the waters, and during their uſe alſo; but I am likewiſe aſſured, this is by no means univerſal, or indeed near ſo common as is generally ſuppoſed. Many who find the greateſt benefit from theſe waters, have derived their complaints from exceſs of theſe evacu-

ations, and consequently stand more in need of cordial and restorative medicines than a farther continuance of what has been the source of the disorder. The same likewise may be said of those who are much debilitated, be the cause what it may. In such cases, I think, I have seen a gentle emetic succeed best, as it is equally efficacious as an evacuant, and much less weakening to the patient than the other means of promoting a discharge. Dr. Williams, in his treatise on the waters of Aix-la-Chapelle, (which in many respects resemble those of Bath) relates many instances of the bad effects of purgative medicines, taken indiscriminately during the use of the waters; and with great judgment highly condemns so absurd and unscientific a practice. By his account, a course of this kind was looked upon as indispensable previous to the trial of the waters, and even during their use; and their choice of medicines of this kind seems not ill adapted to so absurd a practice, being in general Glauber's salt; the impropriety of which, in many of the cases that apply to such waters for relief, is too obvious to need explanation.

I cannot quit this ſubject without making a few remarks on the propriety of adviſing other medicines in general along with a courſe of the waters, either internally or externally uſed.

If medicines are proper during the uſe of the Bath waters.

Some modern writers have with great vehemence inveighed againſt the practice of recommending any other medicine (except perhaps ſome trifling preſcription to keep the body ſoluble) during the uſe of the Bath waters. Among theſe, the late celebrated Dr. Lucas, of Dublin, is among the chief: He profeſſes great indignation at the cuſtom of "loading (as he calls it) "perſons with nauſeous and incongruous "ſhop medicines, who come for the purpoſe of uſing the waters of a medicinal "ſpring;" and he employs the hackneyed argument, that "if medicines could have "been of ſervice, they might have "tried them at home, and the patients "not have been at the trouble and expence of coming to Bath for that purpoſe."

There is no practice, however proper or judicious, that may not ſuffer in the opinion of the world by falſe or invidious

miſrepreſentation. This is eſpecially the caſe with medicine, of which ſo few are capable of judging, and ſo many pretend to decide. The cuſtom of giving nauſeous and bulky doſes of medicine has been, it muſt be owned, but too common; but that it was more frequent at Bath than in other places, I believe, will be difficult to be proved. But ſince the late improvements in pharmacy, this mode of practice has been ſucceeded by another more elegant, as well as at leaſt equally effectual, and theſe improvements have been adopted at Bath as well as at other places. As to incongruous medicines, as he calls them, or ſuch as are inadequate to, or contradict the purpoſe intended, nobody doubts, ſuch are improper; but that theſe are oftener adviſed by the Bath phyſicians than others, may be a doubtful caſe, and wherein the Doctor's judgment may be juſtly queſtioned, eſpecially as his expreſſion is in itſelf vague, and unſupported by any fact which he has produced.

As to the propriety of giving medicines at all during the uſe of the waters, I declare it to be my opinion, that they may in many caſes be adminiſtered with great

advantage.

advantage. I know no effect to be wished for from the Bath waters which medicines of a similar intention might not, judiciously given, promote; nor any operaration of such medicines which the Bath waters would not rather assist than counteract.

This is equally true of their internal as their external use, such only excepted as may be affected by the waters in the way of chemical decomposition, which I have mentioned in the first volume of this work. But when the waters are used externally, it is obvious that no medicines need be excepted to on that account. I have myself seen mercurial, antimonial, and chalybeate medicines, opiates, bitters, the bark, musk, castor, asafœtida, with many of inferior efficacy, taken during a course of bathing with the best success.

Hoffman,* with whom the warm bath was a favourite remedy, and who was perfectly

* Denique & hoc addendum puto: quod operationem medicamentorum, quæ magna aut heroica sunt, balnea tepida omnium optime secundent, ut longe nobiliorem effectum exserant. Nunquam facile secundum nostram sententiam atque experientiam mercurialia modo salivationis, modo evacuationis per sudorem sine, sive in lue venerea, sive in aliis

perfectly well acquainted with its virtues, was so far from advising the omission of other medicines during its use, that he recommends it expressly along with a great number, for no other purpose than to second and improve their efficacy. Why this advice may not, with equal propriety, be applied to the Bath waters, I am at a loss to say.

As to the other trite objection, that medicines might be tried at home without the trouble and expence of coming to Bath

aliis rebellibus morbis, propinanda sunt, nisi balnei usus intercedat. Hoc enim dum relaxat summam cutim porosque aperit, id effecit, ut corruptus humor non tanto cum impetu ad fauces vel etiam alia loca urgeatur, sed magna ex parte per tubulosam cutis substantiam ex intimis sedibus evocetur: ut adeo tutó admodum curam cum mercurialibus instituere liceat. Veteres, chymicis & validioribus medicamentis destituti, in rebellibus morbis hellebori albi usum multum præstabant; sed nunquam eum facile adhibebant, nisi prius in balneum corpus demissum fuisset; quoniam id non modo fluidiores & mobiles reddit humores, sed etiam vias relaxat, ut eo melius peccans humor adducatur. Neque etiam tunc facile periculosum symptoma a validioribus purgantibus, quæ spasmo operantur, metuendum fuit. Martialium porro virtus in chronicis morbis, atque etiam in malo hypochondriaco, non contemnenda est; sed ne astrictione noceat balneum opportunissime interponitur, quo humores ad motum & exclusionem eo facilius præparentur. Et nullum quoque dubium est, quin Cortex Chinæ, aliaque adstrigentia, quorum magna vis est in intermittentium paroxysmis cohibendis, longe tutius sub decenti balneorum usu, usurpari possunt. *Hoffman, de balneor. aq. dulc. usu.*

Bath for that purpose, is is equally frivolous. If Bath had been advised merely as a more proper place than any other for the trial of medicines, which might be had any where else, this argument might have some weight; but as this is not the case, and medicines are only advised to second or concur with, or as preparatory to the use of the waters, which can be had only (in perfection) there, it can have none. Why those who frequent this place for their health should be confined to the waters only, and not be suffered to make use of every other means that art can furnish, those who made the objection are best able to explain. As to the impropriety of directing medicines to those who come to make trial of a mineral water, I can only answer, that I never understood the intention of the patient was to govern the directions of the physician. Whatever the former may be, it is the duty of the latter to advise what his judgment directs; and those who have already laid down a plan for themselves, have no occasion for such directions, and, consequently, had better spare themselves the trouble and expence of procuring it.

I should

I ſhould not have ſaid ſo much on this ſubject, had I not been well aſſured that ſuch notions had been induſtriouſly propagated from intereſted motives, by ſome from whom it might have been leaſt expected. But though I am fully ſatisfied of the propriety of adminiſtering other medicines in many caſes during the uſe of the Bath waters, I would by no means be underſtood to adviſe a farrago of phyſic. The greateſt inſtance of the improvement of medicine, in the preſent age, is the ſimplicity to which it is reduced: Yet the beſt writers allow, that ſome degree of compoſition is often neceſſary. It has been the fate of moſt improvements to be carried to an extravagant length; and perhaps this may have been the caſe in the preſent inſtance. Becauſe ſome have adviſed too much medicine with the waters, others have concluded that none was neceſſary. But the truth here, as in moſt diſputed points, ſeems to lie between the two extremes. Medicines concurring in intention may certainly be adminiſtered during the uſe of the waters; but, on the other hand, due regard muſt be had to their bulk, frequency of exhibition, &c.

when

when the waters are taken internally; and to the degree of effect they are likely to produce when conjoined with the waters, whether the latter be internally taken, or externally applied.

The immersion in the baths at this place is seldom total, and, I believe, the same rule holds in hot baths in general. This, I imagine, was derived from the old notion of revulsion; it being the opinion, that the application of warm water to any part of the body invited the blood to that part. The physicians therefore, whilst this notion continued, were fearful of advising the head to be bathed, for fear of accumulating the blood there, and endangering its stagnation or extravasation in a part so important to life. As to the degree of immersion.

But although this theory has been in a great measure exploded, the practice built upon it still continues in a great measure. Indeed of late years it has been customary now and then to direct a total immersion; but except this was particularly ordered, it was seldom done in the usual method of bathing.

A pedi-

A pedilavium of the Bath waters is likewise in frequent uſe. This, I cannot forbear obſerving, is managed in a much better manner than in the common way. The veſſel containing the water is much deeper, and conſequently covers the legs, which in the uſual method are expoſed to the air, which is often very detrimental, and more than counterbalances all the good effects of the application of warm water to the extremities. As to the difference in effect of a partial bath from an univerſal one, what has been already ſaid of common water is equally applicable to the Bath waters.

Of pumping.

The Bath waters are not uſed in the way of quiet immerſion only, but ſometimes are thrown with a degree of force upon the part, as in pumping. Of the nature of this in general, and the circumſtances wherein its effects differ from quiet immerſion, I have ſpoken in the former part of this work.* One thing is neceſſary to be obſerved here, that the heat of the water uſed in the pumps is ſeveral degrees hotter than the water of the bath, as

* Page 138.

as the former comes immediately from the reſervoir which ſupplies the bath, into which the ſpring firſt riſes, which is under ground, and conſequently the water it contains hotter than the other in the bath, which has ſo large a ſurface expoſed to the air.

Pumping has been, of late years eſpecially, in great uſe at this place. It is moſtly employed in local complaints, and ſometimes, I believe, in general diſorders, wherein the patients are looked upon as too weak to bear a total immerſion. The intentions with which it is uſed appear to be much the ſame with thoſe of the bath. Thus it is uſed with great ſucceſs in the palſy, which is indeed generally, in ſome meaſure, a local complaint, as one ſide of the body, or ſome particular limb, is more affected than the others. Dr. Charlton mentions ſeveral caſes of palſy of various kinds, wherein it was of the greateſt uſe; and this, as well as bathing, makes a part of the hoſpital practice in this diſorder. The ſtream of water is generally directed to the limb, or part affected, and ſometimes to that part of the ſpine whence the nerves, that ſupply the

part

part affected, iſſue forth. Pumping has likewiſe, by the ſame quality, been found very efficacious in reducing diſlocations of the vertebræ, whether occaſioned by accident, or diſorder. The muſcles and ligaments that ſerve to retain theſe in their proper ſituation, are in this caſe generally over-ſtrained, and injured in their tone; but by the ſtimulus of the ſtream of water falling on them, are gradually excited into action, and thus aſſiſt greatly to bring the diſlocated vertebræ again into their proper places. Contractions of the limbs likewiſe have been greatly relieved by pumping, in which diſorder it is generally made uſe of, either by itſelf or joined with bathing.

I have likewiſe ſeen a diſorder of the knee greatly relieved, and nearly cured, by pumping, which was owing to an over-diſtention of the capſular ligament, occaſioned by too great exerciſe in walking. The eminences or condyles of the thigh bone, and of the tibia, not being retained firmly in their places, where they mutually paſs one into the other at the articulation, were ſubject on motion to frequent partial diſlocations, which occaſioned the edges of the bone to grate againſt each other,

other, and caufed exquifite pain. Befides this, there feemed to be a deficiency in the fecretion of the fynovia, or liquor, that ferves to lubricate the internal part of the articulation, as there was a grating noife heard on the motion of the joint. There was likewife a confiderable degree of external fwelling, and an almoft total lamenefs of the whole limb. All thefe complaints were nearly removed by the ufe of the pump, continued for about three months fucceffively. Some little weaknefs and pain on any violent motion ftill remained, but the ufe and motion of the limb, in all directions, was perfectly reftored; the crackling noife, on motion, removed; and the tumor reduced. 'Tis proper to obferve on this cafe, that a ftillicidium of common hot water had been tried before without effect.

White fwellings likewife, when beginning, and before the formation and collection of matter, are often difcuffed without coming to that crifis, which is almoft always productive of the lofs of the motion of the joint, and often of lofs of the limb itfelf, where it is formed.

Pumping is likewiſe very efficaciouſly employed as an antiſpaſmodic in nervous caſes. Dr. Charlton mentions a remarkable inſtance of an involuntary motion of the right arm, attended with convulſion fits, which was entirely cured by a long and ſteady adherence to a courſe of pumping upon that and the ſpina of the back.

I have likewiſe ſeen a nervous head-ach cured by pumping the head with Bath waters. Dr. Percival has mentioned a remarkable caſe of a great pain in the head, evidently of the ſpaſmodic kind, which was greatly relieved by a ſtillicidium of hot water let to fall on the part of his head which was moſt affected, joined to the uſe of the warm bath.

I have likewiſe ſeen a nervous deafneſs entirely cured by pumping on the ſide of the head.

Pumping is likewiſe uſed ſucceſsfully in the gout, towards the end of the fit, when the pain and inflammation are nearly gone, yet the ſwelling remains, as frequently happens towards the decline of life. In fits of the gout likewiſe, that have been protracted to a great length, pumping is of great ſer-

vice;

vice; gently ſtimulating the abſorbent veſſels to take up the fluid, and by its diaphoretic quality promoting the means of its evacuation.

By its laſt-mentioned quality, and perhaps by its ſtimulus likewiſe, it is often of ſervice in rheumatic complaints, eſpecially when fixed in any particular part, as the hip, loins, arms, &c. But here great caution ſhould be uſed not to make trial of it as long as any inflammation or fever remains.

Pumping is likewiſe, I ſee, adviſed in the tinea capitis, or ſcald head, as it is called, and as is ſaid with good ſucceſs. But here I ſuppoſe it is not uſed on account of any peculiar good effect to be expected from that mode of application, but only as that is the moſt convenient method of adminiſtering a topical bath to ſuch a part as the head.

Cælius Aurelianus * adviſes this method of applying the bath to be followed in the ele-

---

* Cataclyſmus, hoc eſt aquarum à ſupernis illiſio. *De elephantiaſi.*

elephantiaſis; but I believe the bath is commonly in uſe at this place in ſuch caſes.

Theſe are the general caſes in which pumping is indicated as diſtinct from bathing, though both are often uſed at the ſame time, either by pumps in the baths, which are uſed during bathing, or by pumps on the outſide, which may be employed without bathing, called *dry pumps*.

I cannot here omit mentioning a great advantage which I think the Bath waters have relative to this operation over common water, relative to the equability of its heat. If the latter were uſed for that purpoſe, it would ſcarce be poſſible to make it always of the ſame temperature; and probably, as this muſt be left to ſervants, it would ſometimes be ſo hot as to ſcald the part to which it ſhould be applied, and at others to injure the patient by its coldneſs. But the Bath waters are in no danger of ſuch variation, as they are always of the ſame degree, which is ſufficient for every purpoſe of a hot bath in every mode of application.

On a vapour bath of the Bath waters.

On this ſubject I have little to ſay from experience. A vapour bath of this kind has

has been for ſome years conſtructed at the Abbey baths, but from the imperfection and inconvenience of its conſtruction has been little uſed, if at all. It ſeems extraordinary, that this ſhould have never before been attempted, ſince at Aix-la-Chapelle they have been long erected, and in conſtant uſe. I doubt not that the ſame might be eaſily done at this place, ſince by the ſpecimen before mentioned it appears, that the heat is ſufficient to exhale ſteam enough for any purpoſe of that kind. The ſteam of the waters has ſome, though but little ſmell of the ſulphureous kind, but is plentifully impregnated with fixible air, as I found by ſeveral experiments. As the ſulphureous and aërial impregnations are the moſt important of any, and the vapour that ariſes contains both in conſiderable proportion in a volatilized ſtate, it is not unreaſonable to ſuppoſe that a bath of this kind might be advantageouſly employed in many caſes, wherein vapour is preferable to the immediate contact of the water. I believe, likewiſe, that the fixible air might, by confining the vapour, be applied in a much more concentrated form than as diffuſed through

the water in the bath, and perhaps by theſe means become more ſerviceable in ſome diſorders where an antiſeptic quality ſhould be deſired, as in the ſcurvy, &c. than the bath itſelf. But this, though I think it bears an appearance of probability, is only offered as matter of conjecture.

The pump is generally uſed from twenty to a thouſand ſtrokes. Formerly, it was uſed more freely, to three thouſand and upwards; but ſo large a number is not ſo much in uſe at preſent.

I ſhall ſubjoin, laſtly, for the uſe of the Faculty, a Liſt of the Diſeaſes, according to Dr. Cullen's ſyſtem, (analogous to that inſerted in the firſt volume) in which bathing in the Bath waters is likely to be ſerviceable.

TABLE *of* DISEASES.

CLASSIS I.

PYREXIÆ.

ORDO I.

FEBRES.

SECT I.

INTERMITTENTES.

In the intervals of the paroxyſms, bathing in the Bath waters may be of the greateſt ſervice, eſpecially when the fit is attended with ſpaſmodic ſymptoms, as in the *Tertiana ſpaſmis, et motibus convulſivis ſtipata.* CULLEN.

ORD. II.

PHLEGMASIÆ.

GENUS XXII.

RHEUMATISMUS.

IDIOPATHICÆ.

Rheumatiſmus vulgaris. Sauv. ſpec. 1.

Warm bathing is here very ſerviceable towards the decline of the paroxyſm.

Rheumatismus calidus. Sauv. spec. 5.

The use of the Bath waters externally is equally proper in this as the foregoing.

Arthritis rheumatica. Sauv. spec. 3.

This is well suited to a trial of the Bath waters externally.

Lumbago rheumatica. Sauv. sp. 1.

The warm bath is well adapted to this species.

Nephralgia rheumatica. Sauv. sp. 4.

This species is well suited to a trial of the Bath waters externally.

Ischias sanguineum. Sauv. sp. 2.

This species, which is owing to retention of the natural discharges, is extremely well adapted to the Bath waters thus used.

*Ischias rheumaticum.** Sauv. sp. 10.

The Bath waters, used as baths, are the best remedies for this complaint.

SYMP-

---

* Balnea domestica calida, thermæ etiam sulphureæ prosunt. *Sauvage.*

SYMPTOMATICÆ.

Rheumatismus scorbuticus. Sauv. sp. 4.

Bathing is certainly very well adapted to this complaint.

——— *metallicus.* Sauv. sp. 10.

Bath waters are highly adapted for the relief of this symptom, externally used.

——— *hystericus.* Sauv. sp. 7.

Warm bathing must be certainly useful in this complaint.

GENUS XXIII.

ARTHRITIS.

ARTHRITIDIS VARIETATES.

1. PRO TEMPORE ANNI.

Arthritis hyemalis. Sauv. var. 2.

——— *æstiva.** Sauv. var. 4.

In both these warm bathing is proper.

2. PRO CAUSA REMOTA.

Arthritis rachialgica. Sauv. var. 11.

Bathing is highly proper here.

 Rheu-

* Sauvage advises the warm bath here.

*Rheumatismus arthriticus.** Sauv. sp. 3.

This is certainly suited to a trial of the warm bath.

3. Variat. Complicata.

Arthritis chlorotica. Sauv. var. 5.

Warm bathing is undoubtedly proper here.

——— *melancholica.* Sauv. var. 5.

——— *scorbutica.* Sauv. var. 7.

Warm bathing is certainly proper in both these cases.

CLASSIS II.

Neuroses.

Ordo I.

Comata.

Genus XX.

Paralysis.

1. Idiopathicæ.

Hemiplegia ex apoplexia. Sauv. sp. 7.

Bathing is here frequently of the greatest service.

Paralysis serosa.† Sauv. sp. 12.

Bath

* Sauvage advises the use of sulphureous baths.

† Sauvage advises warm stimulating baths and pumping in the hemiplegia serosa, which appears to be the same disorder under another name.

Bath waters, externally applied, are here remarkably efficacious.

*Hemiplegia ſpaſmodica.** Sauv. ſp. 2.

I make no doubt the bath would here extremely ſerviceable.

——— *ſaturnina.* Sauv. ſp. 14.

Warm bathing is here extremely ſerviceable, and generally effects a perfect cure.

Paralyſis metallariorum. Sauv. ſp. 22.

Tremor metallariorum. Sauv. ſp. 5.

In both theſe the Bath waters, externally uſed, are very efficacious.

Paralyſis traumatica. Sauv. ſp. 4.

This ſpecies, which is counted incurable by Mr. Sauvage, is often greatly relieved, and nearly cured, by bathing and pumping with the Bath waters.

——— *rheumatica.* Sauv. ſp 3.

This ſpecies is well adapted to a trial of the warm bath.

Hemi-

* Sauvage relates a caſe of a perſon who, after having tried all the moſt celebrated remedies in vain for this diſorder, was at laſt cured by the warm bath.

Hemiplegia arthritica. Sauv. sp. 5.

Bathing in these waters is remarkably efficacious here.

Paralysis rachialgica. Sauv. sp. 2.

Paraplegia rachialgica. Sauv. sp. 5.

Both these are extremely well adapted to the use of the bath, being nearly the same disorder.

Paralysis scrophulosa. Sauv. sp. 5.

Bath waters, externally used, are here worthy trial; but by no means a certain remedy.

Paralysis febrisequa. Palsy from fever. Charlton.*

In this, warm bathing is extremely beneficial.

Paralysis ab insolatione.

In this I have seen the Bath waters succeed very remarkably.

Paralysis ab evacuatione suppressa.†

In this, whether arising from the stoppage of the menstrual discharge, the lochia, or

---

* Vide Dr. Charlton's Inquiry, p. 14, 67, 71.

† Vide Dr. Charlton's Inquiry, p. 17, 25.

or the hæmorrhoids, the Bath waters are worthy a trial, though not always succesful.

Paralysis a menorrhagiâ.

In this I have seen the external use of the Bath waters very succesful.

ORD. II.

ADYNAMIÆ.

GENUS XLIV.

HYPOCHONDRIASIS.

1. IDIOPATHICÆ.

Hypochondriasis melancholica. Sauv. sp. 3.

This is extremely well adapted to a trial of the bath.

——— *pituitosa.* Sauv. sp. 4.

Bathing is very proper here.

2. SYMPTOMATICÆ.

Hypochondriasis hysterica. Sauv. sp. 5.

This, when proceeding from a suppression of the natural evacuation, is well suited to the Bath waters.

Hypochondriasis calculosa. Sauv. sp. 8.

I should think this species very proper for a trial of the Bath waters.

GENUS XLV.

CHLOROSIS.

1. VERÆ.

Chlorosis Virginea. Sauv. sp. 1.

This is, undoubtedly, well suited to the use of the Bath waters in this way.

ORDO III.

SPASMI.

SECT. I.

IN FUNCTIONIBUS NATURALIBUS.

GENUS XLVI.

TETANUS.

1. IDIOPATHICÆ.

Tetanus tonicus. Sauv. sp. 1.

——— *emprosthonicus.* Sauv. sp. 2.

——— *opisthotonicus.* Sauv. sp. 3.

——— *holotonicus.* Sauv. sp. 4.

The

The common warm bath * is of great service in all these; and, I doubt not, the Bath waters would be at least equally efficacious.

GENUS XLVII.

TRISMUS.

Trismus traumaticus. Sauv. sp. 2.

Several instances of the efficacy of the common warm bath † in this complaint have been adduced, and the Bath waters are likely to be no less efficacious.

GENUS XLVIII.

CONVULSIO.

Scelotyrbe chorea viti. Sauv. sp. 1.

Bath waters, thus applied, are often of great service in this disorder.

GENUS L.

EPILEPSIA.

IDIO-

* Vide Dr. Chalmers, in Lond. Med. Obs. vol. I. art. 12.

† Vide several cases of this kind in the London Medical Essays.

IDIOPATHICÆ.

Epilepsia pedisymptomatica. Sauv. sp. 6.

I doubt not the bath would be of service here.

——— *cachectica.* Sauv. sp. 2.

This species is very proper for a trial of the bath.

——— *uterina.*

When this proceeds from a retention of the natural evacuations, the bath is likely to prove successful.

GENUS LII.

ASTHMA.

1. IDIOPATHICÆ.

Asthma hypochondriacum. Sauv. sp. 4.

Bathing is very likely to be of service here, especially when it depends on a suppression of some of the accustomed evacuations.

2. SYMPTOMATICÆ.

Asthma arthriticum. Sauv. sp. 5.

This kind of asthma is extremely proper for a trial of the Bath waters.

GENUS

GENUS LV.

COLICA.

Colica biliosa. Sauv. sp. 5.

After due evacuation the bath is very efficacious.

Rachialgia metallica. Sauv. sp. 3.

Warm bathing is of great use in this disorder.

GENUS LVII.

DIARRHOEA.

IDIOPATHICÆ.

Diarrhœa vulgaris. Sauv. sp. 2.

In this the Bath waters, externally applied, are a safe and effectual remedy.

GENUS LVIII.

DIABETES.

I. IDIOPATHICÆ.

Diabetes a vino. Sauv. sp. 5.

This is very proper for a trial of the waters, externally.

GENUS

GENUS LIX.

1. IDIOPATHICÆ.

*Hysterica chlorotica.** Sauv. sp. 2.

Bathing is likely to be extremely serviceable in this species.

2. SYMPTOMATICÆ.

——— *emphractica.* Sauv. sp. 5.

Bathing is extremely proper here.

CLASSIS III.

CACHEXIÆ.

ORDO I.

MARCORES.

GENUS LXVI.

ATROPHIA.

Atrophia nervosa. Sauv. sp. 1.

In this I have seen bathing in the Bath waters of the greatest utility.

ORDO

* Sauvage advises bathing in warm sulphureous mineral waters.

ORDO III.

IMPETIGINES.

GENUS LXXX.

SCROPHULA.

Scrophula vulgaris. Sauv. ſp. 1.

Bath waters, externally uſed, are of great ſervice in many caſes of this kind, if not too far advanced.

GENUS LXXXI.

SYPHILIS.

*Syphilis venerea.** Sauv. ſp. 1.

The Bath waters have been uſed ſucceſsfully in all the ſtages of this diſorder, wherein warm bathing is proper.

GENUS LXXXII.

SCORBUTUS.

Bath waters are likely to be extremely ſerviceable in the firſt ſtages of this diſorder, before it has gone ſo far as to form external ulcers.

GENUS

* Vide Dr. Oliver's (ſenior) Eſſay.

GENUS LXXXIII.

ELEPHANTIASIS.

Elephantiasis orientalis. Sauv. sp. 1.

——— *legitima.* Sauv. sp. 2.

In both these I doubt not the efficacy of bathing in these waters.*

GENUS LXXXIV.

LEPRA.

Lepra Græcorum. Sauv. sp. 1.

In this disorder the baths of this place have long been esteemed sovereign remedies.

Lepra indica. Sauv. sp. 3.

I should imagine the Bath waters,† externally used, likely to succeed here.

GENUS

---

* Probably the Bath waters may be serviceable in several of the other species; but as this disorder is very rare, it can only be judged of from the accounts of others, or from analogy; neither of which in this case are sufficiently clear to authorize the laying down any rules to guide our conduct.

† Sauvage mentions, that the Bath waters were unsuccessfully tried in this disorder, (if I understand him right;) but from his own account the time of stay was too short for a fair trial.

GENUS LXXXVI.

ICTERUS.

Aurigo calculosa. Sauv. ſp. 9.

The baths of this place are here an excellent remedy.

Aurigo ab obſtructione. Sauv. ſp. 6.

Warm bathing is undoubtedly proper here.

Aurigo rachialgica. Sauv. ſp. 14.

Bath waters, externally uſed, are very proper for the relief of this ſymptom.

CLASSIS IV.

LOCALES.

ORD. II.

DYSCINESIÆ.

GENUS CI.

CONTRACTURA.

Contractura dolorifica. Sauv. ſp. 2.
——— *ſcorbutica.* Sauv. ſp. 3.
——— *paralytica.* Sauv. ſp. 4.
——— *rachialgica.* Sauv. ſp. 5.

In all theſe bathing in the Bath waters muſt undoubtedly be adviſeable.

ORDO IV.

EPISCHESES.

GENUS CVII.

OBSTIPATIO.

GENUS CVIII.

ISCHURIA.

In many inſtances, where theſe occur from ſpaſmodic cauſes, the Bath waters thus applied are likely to prove an efficacious remedy.

Additional Experiments *to those contained in* Vol. I.

Experiment I.*

AT the place where the ſprings riſe in the baths, numerous bubbles of air are obſerved to aſcend along with them. A quantity of air of this kind was collected at the King's bath, by inverting a glaſs, and holding it over the bubbles as they roſe, and then conveying it into an inverted bottle, which, when full, was carefully corked up and carried away. The air thus obtained anſwered in every reſpect to fixible air, precipitating lime water, and having every other quality which that ſtance poſſeſſes.

Experiments made at the Hot Bath.†

When the late repairs were made laſt year at the Hot bath, it became neceſſary to

* This experiment was made by my worthy and ingenious friend, Dr. Nooth.

† In the firſt volume of this work it is mentioned, that the lead ciſtern f the King's bath appeared much corroded on the

to dig down according to the courſe of the ſpring, and for ſome diſtance ſurrounding to a conſiderable depth. About the depth of 16 feet, and in the midſt of ground, which was evidently artificial, lay two large rough-hewn ſtones, unequally placed one upon the other, and very near the place where the ſpring roſe; ſo that in its courſe upwards it had probably flowed between them. In the interſtices between theſe was collected a conſiderable quantity, ſome pounds, I believe, of a dark-brown ſubſtance, adhering to the ſtone in a laminated form. This was intermixed with numerous ſmall ſhining particles, and on the ſurface was ſhot into pointed cryſtals, or rather numerous congeries of ſmall cryſ-

tals

---

the inſide by the water. This fact I find has been denied by ſome, and doubted by others. Not to inſiſt on my own authority, (although I ſaw the piece of lead taken from the ciſtern, and examined it carefully immediately after) Dr. Harrington, of this place, a gentleman of undoubted veracity and medical reputation, was likewiſe a witneſs to it, and agrees perfectly with me in the above account. Many other authorities for this fact might be brought, as the piece of lead was brought into a public coffee-houſe, and there ſhewn to a great number of people. I have likewiſe been informed, that the pipe which ſupplies the Croſs-bath pump is, without any marks of external violence, ſo worn away in many places by the ſtream of water paſſing through it, as to admit the impreſſion of the finger from without, and is actually rent for ſeveral inches in one part by the ſame cauſe.

tals in various directions, some horizontal, others pointing obliquely upwards. It had no sensible smell.

EXPERIMENT II.

A small portion (about three grains) of the above-mentioned substance was held in the flame of a candle; a suffocating smell, like that of a burning match, was immediately diffused to a considerable distance.

EXPERIMENT III.

I rubbed a bit of the same substance, and about the same size with that used in the foregoing experiment, over with tallow, and blew the flame of a candle on it with a blow pipe until it ceased to flame: I then powdered it in a glass mortar, and found most of its particles vigorously attracted by the magnet.

EXPERIMENT IV.

I powdered a few grains of the above substance very finely, and rubbed it over a piece of writing paper, and set it on fire: It emitted a sulphureous smell, and numerous bright sparkles, such as appear in fire-works, and are produced by mixing

iron filings with the other combuſtible ingredients.

EXPERIMENT V.

On digging for the Hot bath, about 13 feet below the old bottom of the bath, and about 17 feet below the level of the adjoining ground, was found a bed of clay, of a dark-blue colour, which ſeemed to extend a conſiderable depth. An inſtrument, ſuch as is uſed for boring in mines, was introduced to the depth of 7 or 8 feet, and ſtill brought up the ſame ſubſtance. I procured ſome of the clay brought up in this manner; it ſmelt ſtrong of ſulphur when freſh, and was of a ſaponaceous conſiſtence reſembling marle.

EXPERIMENT VI.

Half an ounce of this clay was rubbed with three drachms of lixivium ſaponarium in a glaſs mortar, for the ſpace of five minutes, when on ſmelling to it, a faint, tho' evident ſmell of hepar ſulphuris was diſcovered.

EXPERIMENT VII.

Three ounces of this clay were put into a crucible, with a piece of bright ſilver

ſtuck into the clay, and ſuffered to remain in the clay for about twenty minutes; on taking the crucible out, a ſtrong and ſuffocating ſulphureous ſmell was very evident, ſo as to be perceivable at ſeveral yards diſtance, and to diffuſe itſelf over the room. The ſilver was turned black in the part expoſed to the air.

Experiment VIII.

A drachm of the compound before mentioned, viz. of the clay and the lixivium ſaponarium, was mixed with four ounces of water, and filtred off through paper after ſtanding an hour. To the filtred liquor was added four drops of ſolution of ſilver, which cauſed at firſt ſome cloud, and on ſtanding changed the colour to a deep purple, inclining to black.

Experiment IX.

A ſilver ſpoon continued ſtuck into the freſh clay three hours without any change of colour.

Experiment X.

A ſilver ſpoon was laid in the mixture of clay and water for four hours without any change of colour.

EXPERIMENT XI.

On ʒii. of the clay was poured ʒi. of ſtrong ſpirit of vitriol, diluted with ℥ſs. of water, a briſk ebullition enſued, with black bubbles, and a ſuffocating ſmell, exactly reſembling the ſolution of iron in that acid.

EXPERIMENT XII.

To ʒii. of diſtilled water were added twenty grains of the ſolution in the laſt experiment, and to theſe put fifteen grains of tincture of galls. Little change of colour was perceived 'till a few drops of lixiv. tart. were added, which immediately produced a dark purple colour.

EXPERIMENT XIII.

Three ounces of the clay were put into a ſmall glaſs decanter with eight ounces of water, corked up, and ſet in a pan of water, and put upon the fire. After continuing about a quarter of an hour, when the water began to boil in the pan, the cork of the bottle was thrown out with great violence. It was then taken from the fire, and after ſettling, about one ounce of

of the clear part was poured off, and to it added four drops of tincture of galls. No ſigns of any alteration of colour appeared.

Experiment XIV.

I conveyed a ſtream of fixible air on the ſurface of the remaining clay and water, by means of a bended tube, and then pouring off an ounce of the clear part, added four drops of tincture of galls: A purple colour was ſtruck immediately: I repeated this after the water had ſtood half an hour, without its producing any change of colour.

The above experiments tend to confirm what has been before ſaid in the firſt volume, of the ſulphureous matter being in a ſtate of actual ſolution in the water, contrary to what Dr. Lucas has aſſerted. The congeries of pyrites was in a cryſtallized ſtate, (an evident mark of its having been in a ſtate of ſolution) lay in the current of the ſpring, and muſt have been depoſited by it, as the ſtones between which it was found were both hewn, and probably their date might be nearly aſcertained,

tained, at leaſt, that the time of their being laid there was probably not more ancient than the Romans leaving Britain, as they were found in the midſt of an old Roman bath, ſurrounded with ruins of Roman antiquity, as capitals of pillars, an altar, and other remains of architecture in that ſtyle. Several coins alſo were found, but none that I ſaw were later than Conſtantius, or older than Nero: The former of theſe came to the throne in the year 337, and died in 361; ſo that the former of theſe dates muſt be the greateſt length of time they could have been there; but probably it was about a century later, in the time of Valentinian III, when Britain was ſeparated from the Roman empire, and the barbarians deſtroyed the ancient monuments of the grandeur of that people.

The experiments need but little remark: The ſulphur and iron both appear to be contained in large quantity in the ſtrata of earth, thro' which the ſpring riſes; but whether the latter acquired theſe ſubſtances from the water, or the water was impregnated from them, is not clear. It may ſeem remarkable, that in the ſubſtance depoſited by the water no calcareous

earth

earth should be found, since I have mentioned that as the substance which holds the sulphur suspended, and which, on standing is actually deposited from the Bath water.

But this precipitation is of a very different kind from one that could happen in the open air; and, I believe, the reason why the earth was not precipitated here is, that it was held in solution by the fixible air in the water, which, when the water is exposed to the air of the atmosphere, is dissipated, and the earth loses its menstruum, or body, that dissolved it, and is of course precipitated. But this, it is obvious, could not happen in the earth. The union of sulphur with water, by means of calcareous earths, is very incomplete; and the former is constantly separating, and attracts part of the iron along with it, as appears in the experiments related.

The sulphur precipitated here appears in form of pyrites, as iron is an ingredient in the waters; but at Aix-la-Chapelle, where there is no iron, it is precipitated in its simple state.*

I have

* Vide Dr. Williams's Treatise on the Aix-la-Chapelle waters.

I have thus finiſhed what I have to ſay on the ſubject of the Bath waters.

I have been more ſolicitous to aſcertain the effects of the waters, and to point out their general indications, than to lay down every particular circumſtance in which they may be of ſervice, or otherwiſe. To do this, would be a moſt laborious and almoſt endleſs work, and much too large to come within the plan of the preſent undertaking.

I have, indeed, ſelected the ſeveral ſpecies of diſorders as laid down by authors; but theſe are again much compounded with one another, and ſeldom appear ſo ſimple as deſcribed. But though they do not exactly anſwer, they may be of great uſe in aſcertaining the general nature of the diſorder, and the propriety of the uſe of this remedy, from analogy of its ſucceſs in ſimilar caſes.

All the experiments cited were made under my own obſervation, except thoſe where the authority is quoted. I have been careful to inſert none of whoſe authenticity there can be any doubt, as they were

were made by persons of the utmost judgment in making the experiments, and veracity in relating their event.

TABLE

TABLE of CONTENTS.

BATHING, warm, definition of, - page 1
Bath, warm, degrees of heat which constitute, 2
——, ——, its action on the body, - - 3
——, ——, variation of its effects, - - 4
——, ——, as to the quality of the fluid, - 4, 7
——, ——, as to the degree of immersion, - 5, 124
——, ——, according to the method of applying the bath, 5, 138
——, ——, according to the form in which the bath is applied, - - - - 5, 140
——, ——, its effects as a stimulant, - 19
——, ——, ——— as a sedative, - - 20
——, ——, ——— as a diaphoretic, - 22
——, ——, ——— as a diuretic, - - 23
——, ——, ——— as an expectorant, - *ib.*
——, ——, ——— as a sialagogue, - - 24
——, ——, ——— as an emmenagogue, - *ib.*
——, ——, when indicated as detergent, - 25
——, ——, ——— in cutaneous disorders in general, - - - - *ib.*
——, ——, ——— in the lepra, - 27
——, ——, ——— in the gout, - - *ib.*
——, ——, ——— on account of the fluid absorbed, - - - - 28
——, ——, ——— on account of the fluid absorbed. In the lues venerea, - - 29

Bath,

Bath, warm, when indicated in the scurvy, 29
——, ——, ———— in glandular obstructions, ib.
——, ——, ———— in the scrophula, - 30
——, ——, ———— in mesenteric obstructions, ib.
——, ——, ———— in glandular complaints in general, - - - - ib.
——, ——, when indicated on account of its rarefying qualities, - - - - ib.
——, ——, ———— in weakness from inanition, 31
——, ——, ———— in menstrual suppression, ib.
——, ——, when indicated as a stimulant, - 32
——, ——, ———— in palsy, - - ib.
——, ——, ———— in the chlorosis, - 33
——, ——, ———— in menstrual obstructions, ib.
——, ——, ———— in cachexy, - 34
——, ——, ———— in liver complaints, - 35
——, ——, ———— in hypochondriasis, - 36
——, ——, when indicated as an antispasmodic, - 37
——, ——, ———— in the colica picton. - ib.
——, ——, ———— in the bilious colic, - 38
——, ——; ———— in the spasmodic asthma, 39
——, ——, ———— in the calculus, - ib.
——, ——, ———— in spasmodic suppressions of urine, - - - - 40
——, ——, ———— in biliary calculi, - ib.
——, ——, ———— in menstrual obstructions, 41
——, ——, ———— in preventing abortion, ib.
——, ——, ———— in the nervous head-ach, ib.
——, ——, ———— in muscular contractions, 42
——, ——. ———— in insanity, - 43
——, ——, ———— in epilepsy, - ib.
——, ——, ———— in St. Vitus' Dance, - 44
——, ——, ———— in hysteric disorders, - ib.
——, ——, ———— in the hypochondriasis ib.
——, ——, ———— in the nervous atrophy, 45
——, ——, ———— in fevers in general, - ib.
——, ——, ———— in intermittents, - 46
——, ——, ———— in continued fevers, - 47

Bath, warm, when indicated in febrile delirium, - 49
——, ——, ——— in the small pox, - - 50
——, ——, ——— in pleurisy and peripneumony, 51
——, ——, ——— in the nephritis vera, - - 53
——, ——, ——— in the phrenitis, - - ib.
——, ——, ——— in inflammations of the bowels, 54
——, ——, ——— in inflammations of the bladder and uterus, - - - - 54
Bath, warm, when indicated as a diaphoretic, - 55
——, ——, ——— in the rheumatism, - 56
——, ——, ——— in the gout, - - ib.
——, ——, ——— in the scurvy, - - 57
——, ——, ——— in the lues venerea, - 60
——, ——, ——— in the cholera morbus, - ib.
——, ——, ——— in the cholic, - - ib.
——, ——, ——— in the dysentery, - - 62
——, ——, ——— in the diabetes, - - ib.
——, ——, ——— in the mania, - - ib.
——, ——, ——— in the lepra, - - 63
Bath, warm, when indicated as a diuretic, - ib.
——, ——, ——— in hepatic obstructions, - ib.
——, ——, ——— in the scurvy, - - 64
——, ——, ——— in the scrophula, - ib.
——, ——, ——— in the lepra, - - 65
——, ——, ——— in the mania, - - ib.
——, ——, ——— in the calculus, - - ib.
Bath, warm, when indicated as an expectorant, - 66
——, ——, ——— in gouty coughs and asthma, - ib.
——, ——, ——— in the peripneumony, - ib.
——, ——, ——— in the spasmodic asthma, - - 67
Bath, warm, when indicated as a sialagogue, - ib.
——, ——, ——— ——— as an emmenagogue, - ib.
Baths, medicated, - - - ib.
———, artificial, - - - - 68
———, natural, - - - - ib.
———, of what they may consist, - - 69

Baths,

Baths, medicated, comparifon of them with thofe of fimple-water, - - - - 73
——, ———, as detergent, - - ib.
——, ———, as abforbed, - - - 75
——, ———, as ftimulant, - - - ib.
——, ———, as antifpafmodic, - - 77
——, ———, as diaphoretic, - - 80
——, ———, as diuretic, - - - 82
——, ———, as expectorant, - - - 83
——, ———, as demulcent, - - - ib.
——, ———, as fialagogue, - - - 84
——, ———, as emmenagogue, - - ib.
——, ———, as antifeptic, - - 86
——, ———, as aftringent, - - 88
——, ———, as cathartic, - - - 91
Bath, warm, contra-indications of, - - 92
——, ——, cautions relative to its ufe, - 99
——, ——, as to the degree of heat, - - 100
——, ——, as to the time of ftay in it, - - 110
——, ——, as to the method of ufing it, - 115
——, ——, as to the time of day, - - 118
—— ——, as to the time of year, - - 119
——, ——, as to the regimen of life, - - 123
——, ——, experiments on, by Dr. Haygarth, - 181
Bath waters, on their external ufe, - - 191
—— ———, as detergent, - - 193
—— ———, as relaxing and foftening the fkin, 194
—— ———, as antifeptic, - - ib.
—— ———, as aftringent, - - - ib.
—— ———, as to the quantity abforbed, - ib.
—— ———, as to their rarefying effects, - ib.
—— ———, if their fpecific qualities can be abforbed by the fkin, - - - 195
—— ———, more ftimulant than common water, 197
—— ———, more antifpafmodic than common water, 200
—— ———, probably lefs diaphoretic, - 201
—— ———, more diuretic than common water, 203
—— ———, indications of - - - ib.

Bath waters, indications of, as stimulant, - - 204
—— ——, —— in palsy, - - ib.
—— ——, —— in palsy from cold, - 207
—— ——, —— in palsy from heat, - 208
—— ——, —— in palsy from rheumatism, - 209
—— ——, —— in palsy from gout, - ib.
—— ——, —— in palsy from cholic, - 210
—— ——, —— in palsy from fever, - ib.
—— ——, —— in palsy from scrophula, - 211
—— ——, —— in palsy from lead, - ib.
—— ——, —— in palsy from mercury, - 214
—— ——, —— in palsy from suppression of natural discharges, - - - 214
—— ——, —— in palsy from excessive evacuations, 215
—— ——, in palsy from external accidents, - 2[illegible]
—— —— —— in the dead palsy, - 217
—— —— —— in the shaking palsy, - ib.
—— —— —— in the chlorosis, - - 219
—— —— —— in the jaundice, - - 221
—— —— —— in the hypochondriasis, - 222
—— —— —— in sterility, - - ib.
Bath water indicated as antispasmodics, - 223
—— —— —— in the colica pictonum, - ib.
—— —— —— in the hysteric colic, - 224
—— —— —— in the asthma, - - ib.
—— —— —— in the jaundice, - - 225
—— —— —— in menstrual obstructions, - 227
—— —— —— as preventing abortion, - ib.
—— —— —— in nervous diseases, - - ib.
—— —— —— in the hypochondriasis, - 229
—— —— —— in the nervous head-ach, - 231
—— —— —— in spasmodic vomiting, - 232
—— —— —— in the nervous atrophy, - 233
—— —— —— in muscular contractions, - ib.
Bath waters, if proper in fevers, - - 237
—— ——, if proper in local inflammations, - 241
Bath waters indicated as diaphoretic, - 243
—— —— —— in the rheumatism, - ib.
—— —— —— in the gout, - - 245

Bath waters indicated in the ſcurvy, - - 253
—— —— —— in the lues venerea, - - ib.
—— —— —— in the cholic, - - 254
—— —— —— in habitual diarrhœa, - ib.
—— —— —— in the diabetes, - - 255
—— —— —— in the leproſy, - - ib.
—— —— —— in the apthoides chronica, - 256
—— —— —— in cutaneous diſorders, - 259
—— —— —— in the calculus, - ib.
—— —— —— as expectorant, - - 260
Bath Waters, contra-indications of - - 261
—— ——, —— in fevers, - - 262
—— ——, —— in inflammations, - ib.
—— ——, —— in hæmorrhage, - - 263
—— ——, —— in immoderate menſtrual diſcharge, ib.
—— ——, —— in plethora, - - ib.
—— ——, —— in diarrhœa, - - 264
—— ——, —— in obſtructions of the viſcera, ib.
—— ——, —— in dropſy, - - 265
—— ——, —— in hernia, - - ib.
—— ——, —— in extreme weakneſs, - 266
Bath waters, obſervations on the method of uſing externally, - - - - - 268
—— ——, —— as relative to their different heats, ib.
—— ——, —— as relative to their ſpecific qualities, 270
—— ——, —— as relative to the time of ſtay in the bath, - - - - 271
—— ——, —— as relative to the method of uſing the baths, - - - 275
—— ——, —— as relative to the time of day, 279
—— ——, —— as relative to the time of year, 280
—— ——, —— as how often it ſhould be repeated, and how long continued, - - 282
—— ——, —— if medicines are proper during their uſe, - - - 291
Bath waters, as to the degree of immerſion, - 297

Bath